Definitions

Meta-linguistic Awareness: Meta-linguistic Awareness may be best described as the competency and/or ability with which one is capable of reflecting upon language by seeing through and beyond the external structure of that language. In other words, it is the ability to comment upon, produce, and comprehend language. Meta-linguistic awareness encompasses two distinct and yet related stages, the intuitive and the conscious awareness stage. *Intuitive stage:* It does not imply any understanding of the processes being used, just the ability to use those processes. For example, a person could be speaking a language and not understanding the underlying conceptual foundations. *Conscious Awareness Stage:* It implies the awareness of the formal nature of the processes one is employing as well as implying accompanying mastery. It is the ability to comment, use and reflect upon the language at a formal level.

Sentence Ambiguities

This task encompasses five types of ambiguities namely, Phonological Ambiguities, Lexical Ambiguities, Surface Structure Ambiguities, Underlying Structure Ambiguities and Phoneme Segmentation with no phonemic distortion ambiguities.

Phonological Ambiguity: An ambiguity that results when two similar phonetic sequences (which differ only in a single phonological segment) identify two separate words, which have different meanings, e.g., craker/quaker (Hirsh-Pasek et al., 1978, p.118).

Lexical Ambiguity: An ambiguity that results when a single phonological sequence identifies two separate words which have different meanings, e.g., bark/bark (Hirsh-Pasek et al.,1978, p.118).

Surface Structure Ambiguity: An ambiguity that results when a single sequence of words can be bracketed in two different ways, identifying different sentence meanings, e.g., (man) (eating fish) / (man eating) (fish) (Hirsh-Pasek et al.,1978, p.118).

Underlying Structure Ambiguity: An ambiguity that results when a single sequence of words has two transformational sources, or two labelings identifying different sequential meanings, e.g., make me a milkshake as make a milk shake for me / out of me (Hirsh-Pasek et al., 1978, p.118).

Phoneme Segmentation Problems with no phonemic distortion ambiguity: Those ambiguities which are caused by a separation of a compound syllabic structure into its components or by the fusion of two or more morphemes into a compound syllabic structure. Separation and combination yield the phonetic effects of different stress patterns, intonation and time intervals. For example: What did the Indian boy say when his dog fell off the cliff? Why, doggone of course. (Hirsh-Pasek et al., 1978, p.118).

Major Hypotheses

Hypothesis 1.

The meta-linguistic tasks encompassing Sentence Ambiguity (jokes), Definition of a Word including Short, Long, and Difficult Word, and Interchangeability of Labels will emerge as a single factor.

Hypothesis 2.

The two specific tasks related to reading comprising Auditory Analysis Test (Auditory Segmentation and Synthesis) and Morphophonological Knowledge will emerge as a second and distinct factor.

Hypothesis 2B.

Auditory Phonological Segmentation and Synthesis will be highly related to the specific tasks related to reading and as such will load on a seperate factor from the meta-linguistic tasks.

Hypothesis 3.

There will be a main effect for reading ability. The four reading groups will be significantly different from each other on both factors. Superior Readers will have the highest score on each factor, followed by Average, Below Average and Significantly Below Average Readers, in turn (at both ability levels of 9 and 11 years of age respectively).

Hypothesis 4.

There will be a significant interaction between factor type and reading level. This analysis is somewhat exploratory and therefore the direction of the interaction is not specified.

Sample

Three hundred and ninety children, consisting of an equal number of males and females, served as subjects. They were selected on the basis of their scores on the Edmonton Public School Board Reading Test (1980), and on the Canadian Cognitive Ability Test (1974). To eliminate possible differences due to the amount and quality of school experience as well as facility with the English language, only Canadian, English speaking children were chosen.

The subjects were obtained from 15 elementary schools in the Edmonton Public School Board. The data was gathered between the dates of January 17, to February 28, 1983 inclusively.

The 7 year old group consisted of Superior Readers only and not Average, Below Average and Significantly Below Average Readers. The relatively large sample size (N=390) and the time required to administer the tasks imposed time restraints. Nevertheless, it was felt that including a 7 year old Superior Reading group would provide an additional point across the Superior Reading groups particularly with respect to a qualitative analysis responses to the tasks. This, it was thaught, to further clarify the relationship between meta-linguistic ability and age.

Three criteria were considered with respect to the selection of the sample population. These were: academic achievement (reading level), IQ, and age. The requirements for each will be subsequently discussed. A detailed description of the sample is provided in Table 1.

Academic Achievement and Age Criteria

Twenty five students at each of the age levels of seven, nine and eleven years served as Superior Reading Groups. In addition, twenty 9 and 11 year olds at each of the following reading levels: Average Readers (AR), Below Average Readers (BA) and Significantly Below Average Readers (SBA) were selected from children attending regular classes in the Edmonton Public School System.

Superior and normal readers were selected from those children with no record of academic problems in their respective grade levels. This was determined by an examination of the Cumulative Records of each individual. The superior readers were selected on the basis of having scored greater or equal to the 75th. % ile.on both the decoding and comprehension subtests of the Edmonton Public

TABLE 1

DESCRIPTION OF SEX, CHRONOLOGICAL AGE AND IQ CHARACTERISTICS OF SUBJECTS (N = 390)

			C.A. CHARACTERISTICS		I Q CHARACTERISTICS						READING CHARACTERISTICS			
GROUPS	N	SEX			VERBAL		QUANTITATIVE		NON VERBAL		DEC. %ILE		COMP. %ILE	
			X*	SD	X*	SD	X*	SD	X*	SD	X*	SD	X*	SD
7-YR. OLD SUPERIOR READERS	25	M	87.680	2.641							90.600	5.986	88.120	6.870
	25	F	87.040	3.089							88.230	7.587	87.680	6.033
9-YR. OLD SUPERIOR READERS	25	M	110.720	2.851	119.520	9.310	118.080	9.309	118.080	8.391	86.240	8.932	85.440	6.995
	25	F	11.600	2.598	123.560	8.140	116.720	7.961	120.880	9.576	90.120	7.463	88.880	7.097
11-YR.OLD SUPERIOR READERS	25	M	136.560	2.567	121.640	4.881	118.680	6.190	120.120	6.438	88.640	5.859	90.040	6.432
	25	F	134.960	3.529	123.240	8.843	119.920	6.538	121.040	8.839	90.040	7.144	89.040	7.749
9-YR. OLD AVERAGE READERS	20	M	110.950	3.410	105.700	6.705	102.650	5.788	103.550	6.419	57.250	6.282	59.250	5.857
	20	F	108.100	2.972	107.100	6.078	103.650	4.955	105.100	6.198	57.650	5.122	57.450	5.689
11-YR. OLD AVERAGE READERS	20	M	136.650	2.183	108.300	8.189	107.900	6.797	109.400	6.863	59.250	4.315	61.550	3.886
	20	F	136.300	2.755	106.150	6.037	104.650	6.596	104.900	6.797	61.000	2.902	61.850	2.758
9-YR. OLD BELOW AVERAGE READERS	20	M	112.150	3.249	100.100	3.249	99.500	2.893	99.900	1.971	26.600	2.501	28.350	3.646
	20	F	112.150	2.777	103.050	5.395	102.200	4.584	102.100	6.147	29.250	2.049	32.050	3.649
11-YR. OLD BELOW AVERAGE READERS	20	M	134.000	2.938	106.150	9.577	105.450	9.099	103.650	6.201	30.900	5.553	30.550	4.740
	20	F	135.350	3.117	108.500	7.345	106.350	7.485	106.000	5.601	29.850	3.617	30.750	4.745
9-YR. OLD SIG. BELOW AVERAGE READERS	20	M	112.150	3.731	100.850	2.621	99.450	3.818	100.250	2.881	8.750	4.822	8.300	4.414
	20	F	110.450	3.576	102.450	2.259	101.700	2.320	102.350	2.641	8.000	4.329	8.500	4.286
11-YR. OLD SIG. BELOW AVERAGE READERS	20	M	136.300	2.386	99.600	9.467	102.850	3.717	102.300	2.993	9.050	4.383	12.050	2.819
	20	F	136.100	2.990	101.600	3.267	101.950	3.720	101.500	3.502	9.000	4.542	11.000	4.000

* (months)

School Board Reading Test. The normal readers' performance on this test reflected a score ranging from the 50th. to the 65th. %ile. on both decoding and comprehension subtests. The below average reader was characterized as experiencing difficulty in the areas related to reading. Specifically, this group of children are described as performing between the 25th. and 35th. %ile., inclusive, on both the decoding and comprehension subtests. Finally, the severe reading disabled group was selected on the basis of their experiencing numerous problems with reading tasks and specifically scoring less than or equal to the 15 th. %ile. on both the decoding and comprehension subtests.

IQ Criteria

IQ scores were obtained for children participating in this study with the exception of the seven year olds. These IQ. scores were not available since the Edmonton Public School Board administers intelligence tests beginning at the grade 3 level. Full Scale IQ scores of 85+ were considered an index of normal intellectual ability.

IQ scores for the four groups were obtained from the school records.(Canadian Cognitive Abilities Test, 1974). A brief description of the Canadian Cognitive Ability Test and the Elementary Reading Test utilized in this study, will now follow.

Canadian Cognitive Ability Test

The Canadian Cognitive Ability Test is primarily a revision and an extension of the Lorge Thorndike Intelligence Test. The CCAT encompasses three subtests: A Verbal (V), a Non Verbal (NV) and a Quantitative (Q) subtest for grades 3 to 12.

The Verbal subtest score, measuring verbal ability and/or scholastic aptitude, is achieved through direct measures of vocabulary, sentence completion, verbal classification and verbal analogies questions. The Quantitative subtest is higly school oriented and measures quantitative relations, number series and equation building. The Non Verbal subtest does not employ words or numbers. The total score is achieved via the individual's performance on figure analogies, figure classification and figure synthesis sections of the test.

Reliability: The K-R 20 reliability estimate of raw scores for the V, Q and NV subtests are quite high (.89 to .96) for all levels of the test. When speed was taken into consideration, the reliability remained quite high (.87 to .94).

Validity: Concurrent correlations of the C.A.T. subtests with I.T.B.S. (grades 3 to 8) or the T.A.P. (grades 9 to 12) are quite high. Specifically, the V subtest correlates the highest (approximately .75), the Q subtest correlates at about .70 while the Non Verbal subtest is the lowest at about .60. The Q subtest correlates higher with mathematics than the V subtest (.77 vs. .73 respectively) for grades 3 to 8. The correlations of the V, Q and NV subtests with the Stanford Binet are about .65 to .75.

Elementary Reading Test

The Elementary Reading Test (Edmonton Public School Board Reading Test)-Grades 3 through 6 was designed to assess Decoding Skills and Comprehension Skills. The Validity of this test was not determined statistically but was determined to be valid by a committee of elementary teachers, consultants, and Reading Specialists who constructed, reviewed, and revised the test.

The reliability of this test was calculated using the Kuder-Richardson 20 formula. The reliability of the test for different grade levels is as follows:

Grade 3= 0.932
Grade 4= 0.951
Grade 5= 0.949
Grade 6= 0.945

Choice of Tasks

The test battery described in this section is designed to sample meta-linguistic awareness, its development, and its relationship to reading acquisition.

Tests are selected from a variety of different sources, as no appropriate test battery is available. Accordingly, the tasks chosen as measures of meta-linguistic awareness have been previously used, individually, to measure this particular skill. Thus, "Word Awareness Test" "Sentence Ambiguity Test" and "Interchangeability of Labels" were adopted as generic metalinguistic measures.

Furthermore, since the proposed study is also concerned with reading acquisition, a number of tasks which have been directly related to both meta-linguistic skills and o reading itself were adopted. These tasks were: Auditory Analysis Test (Rosner & Simons, 1978); Morphophonemic Knowledge Test (Berko, 1958; Berry 1966; Doehring et al., 1981); Short Term Memory Test (Doehring et al., 1981; McNeill, 1970). The above tasks are subsequently described.

Reading itself was measured by the Edmonton Public School Board Reading Test (1980).

Experimental Tasks

The tasks were presented in a randomized order and included the following: Word Awareness Task; Ambiguity of Sentences (jokes); Interchangeability of Labels; Short Term Verbal Memory; Morphophonemic Knowledge Task; Auditory

Analysis Task (Auditory Phonological Segmentation & Synthesis).

Word Awareness Task

This task, being similar to that used by Berthoud-Papandropoulou (1978), requires each subject to provide a definition of the term 'word' as well as to provide examples of words containing certain properties (a 'long' word, a 'short' word and a 'difficult ' word). Furthermore, subjects were requested to justify the example they provided for each word property. It was anticipated that this task would provide an insight into the subject's awareness of the elements of language and objects in the outside world.

Qualitative analysis was also performed on the children's responses and the changes in pattern were studied. This test was administered individually and required 5 to 10 minutes of administration time. The responses were scored according to the Berthoud-Papandropoulou's (1978) criteria:

A score of 1 was given if the response indicated a failure to differentiate between words,and/or things and/or action.

A score of 2 was given if the response indicated a greater differentiation from the reality they represent. For example: "Words are seen as labels that correspond to things, and as such, have an independent existence"(Berthoud-Papandropoulou, 1978, p.59).

A score of 3 was given if the response indicated that words are considered to be larger meaningful units. For example: Words are part of a sentence.

A score of 4 was given if the response included grammatical terms. However, the individual was not aware that these grammatical terms refer to subsets.

A score of 5 was given when the response indicated meaning. For example: a word is made up of letters and it tells you something.

A score of 6 was given when the response indicated that words which do not have meaning outside a sentence are still words. For example: prepositions, articles.

A score of 7 was given when the response included grammatical nomenclature and the individual realized that the terms referred to subsets.

A score of 8 was given when the response included reference to the sentence, formal categories and the grammatical rules that link them.

Ambiguity of Sentences Task

This task measures the subject's ability to appreciate and explain jokes that 'turn' on a variety of language ambiguities. The stimuli, scoring procedure and instructions were derived from Hirsh-Pasek, Gleitman and Gleitman's (1978) study. These investigators abstracted the jokes from children's joke books as well as magazines and pretested the jokes for vocabulary difficulty. All jokes were at a grade 2 level of difficulty.

Sixty orally presented jokes encompassing 10, 12, 6, 11, and 11 jokes respectively are found in each of the following categories: Phonological, Lexical, Surface Structure, Deep Structure, Underlying Structure, Morpheme Boundary and Morpheme Boundary with no Phonetic Distortion. The jokes, classified according to type of ambiguity, were presented in a randomized order.

The scoring procedure is based on a 1 to 6 point system with the range of possible scores extending from 0 to 300. The subject's explanation of jokes were categorized as follows:

1. 1- Did not understand the joke, and did not know both meanings of all words in the joke.
2. 2- Did not understand the joke but knew the meaning of all the words in the joke.
3. 3- Understood the joke only after encouragment of the sort: "He said, 'so and so' right? Are there two meanings for 'so and so'"?
4. 4- Understood the joke but needed some encouragement to try harder.
5. 5- Understood the joke with little encouragement.
6. 6- Understood the joke immediately and explained it. Testing time for this task was approximately one-half hour per subject. See Appendix A for complete task.

Interchangeability of Labels Task

This task consisted of 4 items, orally presented to each child by the experimenter. For example: *Can I call the sun the moon and the moon the sun? What would night look like?* Children were required to justify their responses as well as to provide examples based on their decision. The scoring method adopted was as follows: One point was given to the child based on a correct "yes/no" response and the child's correct justification. A score of 0 was recorded if the individual provided either an incorrect response or justification. Testing time for this task was approximately 5 minutes. See Appendix A for complete task.

Short Term Memory Task

This task involves a word repetition test of the type used by Doehring et al., (1981).

The subjects was required to repeat a series of 16 orally presented sequences of five words exactly as they had been presented (spoken). This test encompasses four sequences containing unrelated words (U.W.) four containing randomly related words (R.W.), four grammatically correct and meaningless words (G.C.M.), and four meaningfull sentences (M.S.).

Following the Doehring et al.(1981), procedure, the number of correct responses in each subtest were used as total scores. Testing time for this task was approximately 5 minutes. See Appendix A for complete task.

Auditory Analysis Task

Rosner and Simon's (1978) Auditory Analysis Task (A.A.T.) consists of 40 English words varying in length from one to four syllables. The test was administered individually to each student. Subjects were requested to pronounce each word, then to repeat it again omitting a specified sound. With the exception of three words, the omission of a phoneme, phoneme cluster or syllable would result in a pronounceable and meaningful English word. The sounds to be eliminated consists of 13 consonants, one consonant diagraph, two consonant blends and 12 syllables.

The task is ordered in hierarchical difficulty encompassing seven categories:(1) omission of the final syllable of a two syllable word,(2) omission of the initial syllable of a two syllable word,(3) omission of the final consonant of a one syllable word,(4) omission of the initial consonant of a one syllable word,(5) omission of the first consonant of a consonant blend,(6) omission of a medial blend and (7) omission of a medial syllable.

Unlike Rosner and Simon's (1978) procedure, which stopped after 4 consecutive errors or when the individual was unable to understand the training examples, the complete test was administered to all children regardless of their performance. Error scores for each subtest as well as total errors in each subtest were calculated. The test score comprised of the total number of correct responses. The range of the possible scores was from 0 to 40. Testing time for this task was approximately 10 minutes per subject. See Appendix A for complete task.

Morphophonemic Knowledge Task

This task encompasses 3 subtests:(1) knowledge of how to form plurals (PL.) was tested on six trials, (2) past tense (P.T.) was tested on four trials and,(3) third person singular (T.P.S.) was tested on two trials.

Following Berko (1958); Berry(1966); and Doehring et al.,(1981) the following procedure was adopted: each subject was told that they would be presented with some funny pictures, the experimenter would then comment on each of the presented pictures and, finally, each subject was requested to provide some information about the pictures. On each trial the subject was shown a picture(s) and asked to supply the missing word in the statement. Two practice items were provided, for example: *This is a wug; now there is onother one; there are two of them; there are two?*(wugs)(PL.), and *This is a nit who knows how to gutch; he did the same yesterday; what did he do yesterday?* (gutched).

Responses were scored in terms of corrct responses for each subtest as well as the total number of correct responses for all subtests. Testing time for this test was approximately 5 minutes per Subject. See Appendix A for complete task.

The test battery was scored by this investigator and by an independent scorer. The inter-rater reliability was 96%. Any differences in scores given by the two primary raters was discussed with a third rater who made the final decision.

Procedure

The tasks were administered by the author with the help of four research assistants. Three of these assistants were retired teachers and one was a housewife. The research assistants were trained by the author.

The research was carried out in 15 elementary schools in Edmonton. Subjects were tested individually in a private room in their respective schools. The subjects were administered all the tests in either two or three sessions.

Pilot testing of the material, on individual subjects at each grade level, indicated that a short example sequence rather than a formal prescriptive announcement ensured the speediest and most secure understanding of the task requirements. Accordingly, an informal and interactive approach was adopted. In administering the tasks, the following procedural points were considered: (1) individual administration of tests,(2) establishing rapport with the child prior to the administration of the test battery, (3) clarity of instruction, (4) inclusion of sample trial(s) prior to the administration of each test and (5) observation of the child during the testing situation.

IV. RESULTS AND DISCUSSION

This chapter will deal with the findings directly relevant to the predictions presented previously. To facilitate reading, the relevant hypotheses will precede each section. Since the main concern of the study is to determine the relationship between meta-linguistic tasks and the relationship of these tasks to reading skills, the discussion of the results will emphasize this aspect. In pursuit of this goal, attention will first be directed to the relationship between the meta-linguistic tasks and specific tasks related to reading which have previously been used as measures of meta-linguistic awareness.

In order to achieve this goal, first a correlational analysis was conducted followed by a principal factor analysis using subtests of the test battery. The promax-rotated matrices were interpreted. In addition, principal factor and principal component analysis were conducted with total scores. Secondly, the more specific features of meta-linguistic abilities and proficiency with specific skills related to reading were examined within the various ages and across reading levels. A two way analysis of variance with repeated measure (ANOVA), using factor scores as dependent variables, was utilized to detect differences and distinguish reading level groups. Finally, qualitative observations of children's responses to Long, Short and Difficult Word will be presented. In addition children's responses to Interchangeability of Labels and

Word Awareness tasks will be presented and examples provided in order to aid the interpretation of the findings.

Results of Intercorrelation and Factor Analysis

The relevant hypotheses for this section are enumerated as follows: *Hypotheses*

1.) The meta-linguistic tasks: Sentence Ambiguity (jokes), Definition of Word ecompassing Short, Long, and Difficult Word and Interchangeability of Labels will load on a single factor.

2.) The two specific tasks related to reading: Auditory Analysis Test (Auditory Phonological Segmentation and Synthesis), and Morphophonological Knowledge will load on a second factor distinct from the meta-linguistic tasks with Short Term Memory.

In analyzing the data, the correlations and factor analysis were carried out combining all the ability levels of 9 and 11 year old subjects separately. This statistical procedure is adopted since the focus of the study is to investigate the scores across the total range of ability levels. Furthermore analyzing each ability level individually would produce low correlation scores due to the restriction of range. The means and the standard deviations of the variables are presented in Table 2 for 7 year olds, Table 3 for 9 year olds, and Table 4 for 11 year olds.

TABLE 2
MEANS AND STANDARD DEVIATIONS FOR ALL VARIABLES (7 - YEAR OLDS)

VARIABLES	N	MEAN	SD
Phonological Ambiguities	50	31.74	8.58
Lexical Ambiguities	50	33.66	12.02
Surface Structure Ambiguities	50	17.80	7.16
Deep Structure Ambiguities	50	35.36	10.06
Morpheme Boundary With No Phonological Distortions	50	37.36	11.46
TOTAL AMBIGUITIES	50	155.34	41.96
Definition of Word	50	1.34	0.48
Long Word	50	1.04	0.28
Short Word	50	0.86	0.35
Difficult Word	50	0.80	0.40
TOTAL WORD	50	4.04	1.03
Interchangeability Of Labels	50	0.40	0.49

CONTINUED...

TABLE 2 (Continued)
MEANS AND STANDARD DEVIATIONS
FOR ALL VARIABLES (7 - YEAR OLDS)

VARIABLES	N	MEAN	SD
Omission of One Consonant Of One Syllable Word	50	5.44	0.99
Omission Of Initial Consonant Of One Syllable Word	50	5.88	0.39
Omission of First Consonant Of Consonant Blend	50	5.82	1.98
Omission of Medial Consonant	50	6.88	1.69
Omission of Medial Syllable	50	4.92	2.65
TOTAL	50	30.94	5.65
Meaningful Sentences	50	3.28	0.57
Random Words	50	1.10	1.04
Unrelated Words	50	2.02	0.94
Grammatically Correct But Meaningless Words	50	2.14	0.95
TOTAL	50	8.58	2.56
Knowledge of Plurals	50	9.54	0.71
Knowledge of Past Tense	50	7.02	1.12
Knowledge of Possessives	50	5.78	0.46
Knowledge of Third Person Singular	50	2.02	0.62
TOTAL	50	27.92	2.78

TABLE 3
MEANS AND STANDARD DEVIATIONS
FOR ALL VARIABLES (9 - YEAR OLDS)

VARIABLES	N	MEAN	SD
Phonological Ambiguities	170	35.88	9.30
Lexical Ambiguities	170	38.75	10.71
Surface Structure Ambiguities	170	25.57	6.87
Deep Structure Ambiguities	170	37.40	10.97
Morpheme Boundary With No Phonological Distortions	170	37.79	10.67
TOTAL AMBIGUITIES	170	171.28	42.66
Definition of Word	170	1.16	0.52
Long Word	170	0.88	0.41
Short Word	170	0.92	0.29
Difficult Word	170	0.89	0.32
TOTAL WORD	170	3.85	0.97
Interchangeability Of Labels	170	0.58	0.77

CONTINUED...

TABLE 3 (Continued)
MEANS AND STANDARD DEVIATIONS
FOR ALL VARIABLES (9 - YEAR OLDS)

VARIABLES	N	MEAN	SD
Omission of One Consonant Of One Syllable Word	170	5.06	1.11
Omission Of Initial Consonant Of One Syllable Word	170	5.39	0.98
Omission of First Consonant Of Consonant Blend	170	5.99	1.77
Omission of Medial Consonant	170	6.66	1.71
Omission of Medial Syllable	170	5.29	2.67
TOTAL	170	30.24	6.80
Meaningful Sentences	170	3.22	0.90
Random Words	170	1.32	1.14
Unrelated Words	170	2.20	1.18
Grammatically Correct But Meaningless Words	170	2.27	1.15
TOTAL	170	9.04	3.54
Knowledge of Plurals	170	8.93	1.58
Knowledge of Past Tense	170	6.37	1.80
Knowledge of Possessives	170	5.55	0.92
Knowledge of Third Person Singular	170	1.59	0.80
TOTAL	170	26.93	4.90

TABLE 4
MEANS AND STANDARD DEVIATIONS
FOR ALL VARIABLES (11 - YEAR OLDS)

VARIABLES	N	MEAN	SD
Phonological Ambiguities	170	42.25	9.73
Lexical Ambiguities	170	48.36	12.13
Surface Structure Ambiguities	170	46.98	10.53
Deep Structure Ambiguities	170	46.98	10.53
Morpheme Boundary With No Phonological Distortions	170	46.85	9.67
TOTAL AMBIGUITIES	170	208.75	42.13
Definition of Word	170	1.44	0.65
Long Word	170	10.04	0.19
Short Word	170	10.04	0.23
Difficult Word	170	1.01	0.17
TOTAL WORD	170	4.52	0.87
Interchangeability Of Labels	170	1.11	1.13

CONTINUED...

TABLE 4 (Continued)
MEANS AND STANDARD DEVIATIONS
FOR ALL VARIABLES (11 - YEAR OLDS)

VARIABLES	N	MEAN	SD
Omission of One Consonant Of One Syllable Word	170	5.62	0.70
Omission Of Initial Consonant Of One Syllable Word	170	5.72	0.55
Omission of First Consonant Of Consonant Blend	170	6.99	1.26
Omission of Medial Consonant	170	7.16	1.49
Omission of Medial Syllable	170	6.64	1.49
TOTAL	170	30.05	4.92
Meaningful Sentences	170	3.60	0.65
Random Words	170	1.84	1.07
Unrelated Words	170	2.81	0.97
Grammatically Correct But Meaningless Words	170	2.97	0.83
TOTAL	170	11.28	2.88
Knowledge of Plurals	170	8.92	1.21
Knowledge of Past Tense	170	7.05	1.23
Knowledge of Possessives	170	5.71	0.59
Knowledge of Third Person Singular	170	1.81	0.53
TOTAL	170	29.94	3.19

The intercorrelation matrices are presented in Tables 5 and Table 6 for 9 and 11 year olds, respectively. The correlation matrices for each age group were derived from the raw scores of all 170 subjects for the two groups (9 and 11 years of age).

As may be seen from Tables 5 and 6, the intercorrelations for both 9 and 11 year olds among the meta-linguistic tasks were significant. The overall patterns of these results suggest that the meta-linguistic tasks as a whole, correlate highly with each other. More specifically, the intercorrelation amongst the different subtests of the Sentence Ambiguity task were very high (ranging from .550 to .822). In addition, the intercorrelations between the Sentence Ambiguity subtests, Definition of a Word and Interchangeability of Labels tasks were also high. It is interesting to note that intercorrelations of Long, Short, and Difficult Word tasks were low. Their correlations with the meta-linguistic tasks, and with other tasks in the battery were also low.

The three tasks, Long, Short, and Difficult Word, which require an example and justification for the response do not therefore appear to be good measures of generic meta-linguistic abilities. This finding may have been directly related to the nature of the task itself as a relatively high performance can be achieved on this task without understanding the special properties that make natural language unique as a means of communication and

TABLE 5

INTERCORRELATIONS (POOLED) AMONG ALL VARIABLES FOR 9 - YEAR OLDS

VARIABLES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1 Decoding Skills																														
2 Comprehension Skills	.88**																													
3 Phonological Ambiguities	.67**	.68**																												
4 Lexical Ambiguities	.70**	.70**	.74**																											
5 Surf. Struct. Ambiguities	.56**	.57**	.65**	.61**																										
6 Deep Struct. Ambiguities	.76**	.77**	.73**	.60**	.68**																									
7 Morpheme Boundary (No phonol. distortions)	.68**	.71**	.68**	.71**	.55**	.62**																								
8 TOTAL	.77**	.78**	.86**	.89**	.78**	.93**	.87**																							
9 Definition of a Word	.47**	.45**	.43**	.46**	.37**	.38**	.39**	.46**																						
10 Long Word	.30**	.32**	.35**	.26**	.30**	.33**	.38**	.34**	.13																					
11 Short Word	.16*	.17*	.16*	.17*	.18**	.17*	.20**	.20**	.13	.37**																				
12 Difficult Word	.33**	.35**	.23**	.34**	.17*	.24**	.28**	.29**	.26**	.13	.17*																			
13 TOTAL	.53**	.54**	.48**	.53**	.43**	.48**	.47**	.54**	.71**	.64**	.57**	.58**																		
14 Interchangeability Of Labels	.50**	.50**	.46**	.41**	.38**	.48**	.44**	.50**	.22**	.17*	.09	.24**	.30**																	
15 Omisn. Final Consonant (One-Syllable Word)	.51**	.53**	.34**	.42**	.32**	.43**	.46**	.45**	.15*	.33**	.16*	.36**	.38**	.39**																
16 Omisn. Initial Consonant (One Syllable Word)	.44**	.45**	.45**	.40**	.29**	.40	.45**	.46**	.18**	.32**	.17*	.18**	.34**	.34**	.57**															
17 Omisn. Initial Consonant (One Syllable Word)	.55**	.56**	.43**	.34**	.29**	.39**	.33**	.42**	.26**	.10	.05	.24**	.27**	.32**	.44**	.39**														
18 Omission of a Medial Consonant	.56**	.58**	.45**	.54**	.36**	.51**	.54**	.57**	.26**	.38**	.16*	.26**	.46**	.31**	.56**	.58**	.40**													
19 Omission of a Medial Syllable	.65**	.67**	.50**	.53**	.46**	.53**	.54**	.58**	.37**	.26**	.22**	.23**	.45**	.35**	.51**	.43**	.57**	.60**												
20 TOTAL	.71**	.73**	.57**	.60**	.45**	.59**	.59**	.65**	.34**	.35**	.19**	.34**	.50**	.39**	.73**	.68**	.72**	.80**	.86**											
21 Meaningful Sentences	.54**	.55**	.46**	.47**	.53**	.55**	.51**	.56**	.38**	.43**	.18**	.36**	.55**	.26**	.44**	.28**	.34**	.47**	.47**	.53**										
22 Random Words	.36**	.28**	.42**	.38**	.46**	.42**	.43**	.46**	.26**	.17*	.13*	.23**	.32**	.35**	.28**	.23**	.25**	.34**	.44**	.42**	.46**									
23 Unrelated Words	.42**	.43**	.49**	.36**	.43**	.49**	.49**	.53**	.21**	.17*	.10	.15*	.26**	.36**	.27**	.25**	.35**	.34**	.50**	.48**	.49**	.45**								
24 Grammatically Correct But Meaningless Words	.60**	.61**	.54**	.48**	.55**	.54**	.50**	.68**	.38**	.33**	.10	.26**	.46**	.39**	.45**	.38**	.48**	.44**	.58**	.62**	.61**	.51**	.67**							
25 TOTAL	.59**	.60**	.58**	.52**	.61**	.61**	.58**	.66**	.36**	.33**	.19*	.30**	.48**	.43**	.47**	.35**	.44**	.48**	.61**	.63**	.76**	.75*	.82**	.87**						
26 Knowledge of How To Make Plurals	.37**	.38**	.32**	.37**	.34**	.37**	.34**	.40**	.18**	.21**	.20**	.10	.27**	.18**	.31**	.39**	.22**	.42**	.31**	.40**	.32**	.08	.21**	.27**	.27**					
27 Knowledge of How To Make Past Tense	.44**	.45**	.40**	.48**	.39**	.49**	.46**	.53**	.20**	.24**	.07	.16*	.36**	.27**	.36**	.37**	.33**	.56**	.42**	.51**	.41**	.34**	.39**	.37**	.47**	.54**				
28 Knowledge of How To Make Possessives	.36**	.38**	.27**	.32**	.29**	.30**	.30**	.34**	.18**	.21**	.16*	.27**	.32**	.23**	.27**	.25**	.24**	.28**	.23**	.32**	.35**	.12*	.22**	.26**	.28**	.47**	.32**			
29 Knowledge of How To Make Third Person Singular	.28**	.38**	.17*	.29**	.17*	.27**	.27**	.27**	.21**	.08	.10	.30**	.34**	.22**	.25**	.11*	.33**	.25**	.31**	.32**	.26**	.19**	.17*	.23**	.26**	.36**	.32**	.52**		
30 TOTAL	.60**	.60**	.49**	.56**	.53**	.57**	.51**	.61**	.35**	.25**	.19**	.27**	.43**	.36**	.42**	.40**	.43**	.58**	.49**	.58**	.50**	.30**	.37**	.44**	.49**	.77**	.77**	.58**	.55**	

* p < .05
** p < .01

TABLE 6
INTERCORRELATIONS (POOLED) AMONG ALL VARIABLES FOR 11 - YEAR OLDS

VARIABLES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1 Decoding Skills																														
2 Comprehension Skills	.85**																													
3 Phonological Ambiguities	.67**	.69**																												
4 Lexical Ambiguities	.71**	.73**	.60**																											
5 Surf. Struct. Ambiguities	.56**	.56**	.49**	.58**																										
6 Deep Struct. Ambiguities	.59**	.68**	.66**	.73**	.62**																									
7 Morpheme Boundary (No phonol. distortions)	.74**	.74**	.67**	.73**	.58**	.77**																								
8 TOTAL	.76**	.80**	.87**	.93**	.71**	.86**	.88**																							
9 Definition of a Word	.63**	.62**	.52**	.50**	.41**	.58**	.60**	.61**																						
10 Long Word	.29**	.22**	.21**	.20**	.13*	.16*	.15**	.21**	.26**																					
11 Short Word	.36**	.38**	.29**	.38**	.30**	.35**	.36**	.38**	.24**	.29**																				
12 Difficult Word	.13*	.14*	.19**	.21**	.11	.16*	.20**	.30**	.06	.37**	.30**																			
13 TOTAL	.61**	.61**	.53**	.52**	.40**	.57**	.59**	.61**	.88**	.85**	.95**	.41**																		
14 Interchangeability Of Labels	.46**	.47**	.36**	.43**	.38**	.41**	.35**	.48**	.48**	.12	.07	.00	.37**																	
15 Omission. Final Consonant (One-Syllable Word)	.29**	.37**	.25**	.26**	.24**	.34**	.29**	.35**	.37**	.06	.13*	.01	.33**	.23**																
16 Omission. Initial Consonant (One Syllable Word)	.31**	.30**	.23**	.28**	.21**	.35**	.24**	.21**	.20**	.04	.09	.08	.18**	.22**	.28**															
17 Omission. Initial Consonant (One Syllable Word)	.45**	.43**	.24**	.32**	.35**	.36**	.30**	.35**	.34**	.10	.13*	.11	.33**	.30**	.36**	.27**														
18 Omission of a Medial Consonant	.42**	.41**	.31**	.43**	.28**	.33**	.30**	.42**	.21**	.04	.12	.11	.33**	.23**	.32**	.26**	.46**													
19 Omission of a Medial Syllable	.66**	.65**	.44**	.50**	.45**	.46**	.50**	.57**	.45**	.13*	.14*	.15*	.43**	.30**	.40**	.32**	.58**	.52**												
20 TOTAL	.65**	.63**	.43**	.53**	.47**	.51**	.46**	.57**	.44**	.11	.17*	.17*	.43**	.36**	.60**	.47**	.73**	.75**	.85**											
21 Meaningful Sentences	.25**	.25**	.27**	.23**	.31**	.16*	.21**	.27**	.21**	.06	.07	.07	.20**	.14*	.16*	.16**	.28**	.32**	.35**	.37**										
22 Random Words	.46**	.44**	.29**	.45**	.49**	.46**	.43**	.50**	.30**	.12	.15*	.17*	.30**	.29**	.30**	.11	.33**	.33**	.40**	.45**	.40**									
23 Unrelated Words	.31**	.31**	.23**	.32**	.28**	.28**	.21**	.29**	.23**	.04	.17*	.08	.23**	.26**	.28**	.13*	.26**	.28**	.33**	.40**	.45**	.50**								
24 Grammatically Correct But Meaningless Words	.42**	.41**	.36**	.42**	.47**	.40**	.28**	.45**	.26**	.11	.12	.15*	.27**	.22**	.25**	.20**	.35**	.38**	.38**	.48**	.37**	.47**	.65**							
25 TOTAL	.47**	.46**	.44**	.48**	.54**	.45**	.40**	.52**	.53**	.10	.24**	.15*	.25**	.36**	.34**	.19**	.37**	.38**	.45**	.52**	.64**	.77**	.81**	.80**						
26 Knowledge of How To Make Plurals	.25**	.24**	.16*	.18**	.15*	.15*	.09	.17*	.12	.01	.01	-.25	.04	.24**	.12	.06	.22**	.25**	.21**	.23**	.19**	.13*	.35**	.26**	.30**					
27 Knowledge of How To Make Past Tense	.23**	.34**	.25**	.29**	.26**	.29**	.25**	.35**	.25**	.12	.10	.03	.24**	.18**	.29**	.03	.27**	.24**	.27**	.30**	.17*	.27**	.38**	.26**	.33**	.33**				
28 Knowledge of How To Make Possessives	.19*	.14*	.15*	.21**	.16**	.12	.10	.16**	.08	.10	.05	.02	.09	.08	.24**	.15*	.23**	.26**	.20**	.29**	.09	.09	.22**	.20**	.21**	.28**	.29**			
29 Knowledge of How To Make Third Person Singular	.14*	.15*	.09	.11	.16**	.14*	.15*	.14*	.09	.01	.06	.01	.09	.00	.36**	.03	.29**	.22**	.25**	.33**	.09	.07	.17*	.20**	.17*	.19**	.32**	.42**		
30 TOTAL	.40**	.38**	.33**	.34**	.41**	.43**	.35**	.42**	.39**	.06	.12	-.11	.31**	.27**	.37**	.18**	.40**	.37**	.45**	.48**	.33**	.30**	.30**	.31**	.38**	.64**	.69**	.57**	.40**	

* p < .05
** p < .01

representation. Thus, the child's *use* of language to express his general structure of knowledge *about* language - the representational system which the individual has reconstructed and has learned to apply - is not fully 'tapped' by these tasks.

The overall pattern of these results suggest that the meta-linguistic tasks as a whole, with the exception of Long, Short and Difficult Words, correlate highly with each other.

The intercorrelations were also high among the Specific Tasks Related to Reading. This was evident for both the 9 and 11 year olds.

Total scores on Short Term Memory is related to Auditory Phonological Segmentation and Synthesis (r=.63, df=168, p<.01), Morphophonological Knowledge (r=.44, df=168, p<.01), Sentence Ambiguity (r=.66, df=168, p<..01), Word Definition including Long, Short and Difficult Word (r=.48, df=168, p<.01), and Interchangeability of Labels (r=.43, df=168, p<.01). The same pattern is evident for the 11 year old sample. The corresponding correlations with Short Term Memory total were: Auditory Phonological Segmentation and Synthesis (r=.52, df=168, p<.01), Morphophonological Knowledge (r=.65, df=168, p<.01), Sentence Ambiguity (r=.33, df=168, p<.01), Definition of a Word including Short, Long and Difficult Word (r=.35, df=168, p<.01) and Interchangeability of Labels (r=.36, df=168, p<.01). All of these tasks require the the individual to retain the information into some store, process the information and retrieve that information. Therefore, short term memory is a pervasive variable across a variety of tasks.

Factor Analysis

Factor Analysis was carried out in order to further determine the relationship between specific tasks related to reading and the meta-linguistic tasks. Loadings of .4 and above are considered significant. This is an arbitrary decision however, a .4 loading is considered to be a rather conservative cut-off point. The need to be conservative, in terms of the cut-off point, was based on the fact that previous research has reported a high variability in subjects' responses; lack of objectivity of the tasks; and the nature of the data itself.

Principle component analysis for the 11 year olds resulted in 5 eigenvalues greater than 1. However, only 2 principal factors were extracted and rotated, for the following reasons. Examination of the varimax-rotated first 5 components indicated that these components were comprised of: Sentence Ambiguity subtests, Definition of a Word and Interchangeability of Labels; Short Term Memory subtests, Morphophonological Knowledge subtests, and Long, Short and Difficult Word. The eigenvalues for the first five components were 7.3, 2.1, 1.5, 1.4, and 1.3 respectively. Since the eigenvalues leveled off after the second component is extracted and since the five components comprise subtests grouping similar to the test battery, it was felt that more information would be obtained by interpreting a two factor solution. Principle component analysis, for the 9 year olds, resulted in 6 eigenvalues greater than one. The eiganvalues for the first six components were 9.1, 1.6, 1.3, 1.3, 1.2, 1.2, and 1.1, respectively. Examination of the varimax-rotated first five and six components indicated patterns similar to the corresponding matrices for the 11 year olds. Therefore, only two principal factors were extracted and interpreted for the 9 year olds. Factor matrices were rotated to both the varimax (orthogonal) and promax (oblique) criteria. Since the correlations among factors were high for both the 9 year olds (r=.702) and 11 year olds (r=.609), the promax-rotated matrices were interpreted. The pattern matrices for each age groups is displayed in Table 7.

The implications of the correlational data was further supported by the principal component analysis of the 23 variables. As may be seen from Table 7 two factors emerged. The first factor was defined by Sentence Ambiguity, Definition of a Word and Interchangeability of Labels, while the second factor was defined by Auditory Segmentation and Synthesis and Morphophonological Knowledge.

The loadings for Short Term Memory subtests were discrepant across age groups. Short Term Memory loaded on the first factor (META) for 9 year olds and on the second

TABLE 7
PRINCIPAL FACTOR ANALYSIS WITH PROMAX ROTATION OF 23 VARIABLES

TESTS	9 - YEAR OLDS (N = 170)			11 - YEAR OLDS (N = 170)		
	META	SPECIFIC	h2	META	SPECIFIC	h2
Phonological Ambiguities	.881	-.089	.673	.810	-.033	.625
Lexical Ambiguities	.721	.118	.654	.866	.012	.763
Deep Structure Ambiguities	.865	-.002	.746	.850	.008	.731
Surface Structure	.818	-.104	.563	.513	.264	.498
Morpheme Boundary	.731	.100	.648	.892	-.095	.701
Definition of a Word	.497	-.016	.236	.662	.001	.439
Long Word	.112	.361	.199	.369	-.130	.095
Short Word	.028	.256	.076	.393	-.087	.121
Difficult Word	.137	.284	.162	.473	-.266	.141
Interchangeability of Labels	.510	.204	.278	.328	.172	.256
Omission of Final Consonant Of One Syllable Word	.108	.596	.458	.082	.473	.278
Omission of Initial Consonant Of a Consonant Blend	.064	.594	.411	.225	.170	.126
Omission of First Consonant Of a Consonant Blend	.267	.347	.322	.107	.543	.377
Omission of Medial Consonant	.161	.642	.583	.113	.509	.343
Omission of Medial Syllable	.483	.300	.528	.344	.446	.504
Meaningful Sentences	.515	.232	.486	.078	.400	.204
Random Words	.647	-.116	.358	.370	.319	.382
Unrelated Words	.697	-.063	.428	-.019	.670	.433
Grammatically Correct But Meaningless Words	.739	.030	.579	.129	.578	.441
Knowledge of Plurals	.150	.740	.414	-.280	.673	.302
Knowledge of Past Tense	.168	.522	.424	.046	.490	.264
Knowledge of Possessives	-.134	.666	.337	-.258	.653	.288
Third Person Singular	-.141	.618	.280	-.244	.604	.245
% of Total Variance	49.26	32.48		42.19	32.48	
% of Common Variance	63.22	36.78		56.50	43.50	

factor (Specific) for 11 year olds. Loadings on the varimax-rotated factors are displayed in Table 8. The defination of the orthogonal factors (varimax-rotation) is almost identical to that of the oblique factors (promax-rotation), particularly for the 9 year olds. Differences which ocurred usually reflect a slight change in test loadings which alter their salience status without altering the ranking of that test's loading on the two factors. For example, Interchangeability of Labels for 11 year olds. The test has a higher loading on meta-linguistic abilities whether varimax or promax rotation is used. However, the test's loading on that factor exceeds the salience's criteria of .4 only after promax-rotation.

Some researchers have argued that, although oblique rotation enhances simple structure, high correlations among factors are problematic for factor definition. The arguement could be raised that, since a high correlation between factors is evident at both age levels, the two factors cannot be distinguished if obliquely rotated. To determine the stability of the factors' definitions under oblique rotation the salient variables for each factor were compared across rotation methods (promax and varimax). The salient variable similarity index s (Cattell, 1978), was calculated for comparison of orthogonal and oblique loadings for each of the Meta and Specific Factor at each age level. The pattern of salient variables for both factors was basically identical across rotation methods at both age levels. The

TABLE 8
PRINCIPAL FACTOR ANALYSIS WITH VARIMAX ROTATION OF 23 VARIABLES

TESTS	8 - YEAR OLDS (N = 170)			11 - YEAR OLDS (N = 170)		
	META	SPECIFIC	h2	META	SPECIFIC	h2
Phonological Ambiguities	.781	.253	.673	.754	.239	.625
Lexical Ambiguities	.712	.384	.654	.820	.300	.763
Deep Structure Ambiguities	.799	.328	.746	.804	.291	.701
Surface Structure	.718	.216	.563	.565	.422	.498
Morpheme Boundary	.714	.372	.648	.811	.207	.731
Definition of a Word	.453	.174	.236	.625	.222	.493
Long Word	.239	.377	.199	.307	-.000	.095
Short Word	.121	.247	.076	.344	.049	.121
Difficult Word	.238	.324	.162	.363	-.095	.141
Interchangeability of Labels	.481	.217	.278	.414	.291	.256
Omission of Final Consonant Of One Syllable Word	.325	.593	.458	.224	.477	.278
Omission of Initial Consonant Of a Consonant Blend	.284	.575	.411	.265	.237	.126
Omission of First Consonant Of a Consonant Blend	.378	.423	.322	.269	.552	.377
Omission of Medial Consonant	.391	.656	.583	.264	.522	.343
Omission of Medial Syllable	.560	.462	.528	.462	.539	.504
Meaningful Sentences	.563	.411	.486	.197	.406	.204
Random Words	.580	.149	.358	.447	.427	.382
Unrelated Words	.620	.207	.428	.189	.631	.433
Grammatically Correct But Meaningless Words	.695	.310	.597	.300	.593	.441
Knowledge of Plurals	.141	.628	.414	-.056	.547	.302
Knowledge of Past Tense	.352	.547	.424	.191	.481	.269
Knowledge of Possessives	.128	.566	.337	-.041	.535	.288
Third Person Singular	.103	.519	.280	-.043	.493	.245
% of Total Variance	46.19	31.94		40.60	34.10	
% of Common Variance	59.28	40.72		54.38	45.62	

Meta Factor was identical across methods at age 9 (s=1, p<.001) and was essentially the same at age 11 (s=.75, p<.001). Similarly, the Specific Factor was nearly identical across methods at age 9 (s=.82, p<.001) and at age 11 (s=.92, p<.001). These results indicate that the definition of the two factors is not significantly altered by oblique rotation.

The distinctiveness of the Meta and Specific Factors is substantiated by the adherence to simple structure of both orthogonally - and obliquely - rotated factor matrices at both age levels. The s index was used to check simple structure within each factor matrix. Perfect sinple structure would be reflected by a value of 0. At age 9 there was a perfect simple structure with oblique rotation (s=0, p=.5), and nearly perfect simple structure with varimax rotation (s=.18, p>.10). Two of the 23 variables loaded on both varimax rotated factors at age 9. At age 11, a perfect simple structure was obtained with oblique rotation (s=0, p=.5) and nearly perfect simple structure with varimax rotation (s=.27, p>.05). Three of the 23 variables loaded on both varimax rotated factors at age 11. The fact that such low s values were obtained with both varimax - promax rotation supports the claim that the distinctiveness of the factors is not an artifact of oblique rotation. Interpretation of these results are presented below.

Sentence Ambiguity, Interchangeability of Labels and Word Awareness require the individual to look *at* language abstractly. On the other hand, Auditory Phonological Segmentation and Synthesis and Morphophonological Knowledge Tasks both involve the utilization of specific skills which are presented under the direct instruction of the teacher. Their factor pattern provides support for the hypothesis that these two tasks measure two different processes. The two factors obtained were therefore labeled Generic Meta-linguistic Awareness (Meta) and Specific Skills Related to Reading (Specific), respectively.

It is interesting to note that 4 of the 5 subtests comprising Phonological Segmentation and Synthesis test load on factor II (Specific) for both the 9 and 11 year old groups. Traditionally, researchers have described Phonological Segmentation and Synthesis ability as "meta-linguistic awareness" (Read, 1978), or "metacognitive awareness" (Clark, 1978). However, results of this factor analysis support the idea that these skills involve a number of abilities which some authors have also suggested (Sinclair, Jarvella & Levelt, 1978). The results of the present factor analysis indicate that phonetic segmentation and synthesis might be better characterized as access to linguistic segments rather than meta-linguistic ability. This idea is supported by the present findings in that Auditory Phonological Segmentation and Synthesis generally loaded on a seperate factor distinct from those tasks which may be more clearly considered to be measures of conscious linguistic activity (eg., Sentence Ambiguity, Interchangeability of Labels and Definition of a Word). It seems that Auditory Phonological Segmentation and Synthesis should not be regarded as a task which is highly related to generic meta-linguistic awareness. Rather, it appears that it is part of a language based skill which is learned in school and may not require a high degree of abstract usage and knowledge of language.

A rather surprising finding is evident with the Short-Term Memory Task in that the data demonstrate some inconsistent loadings described at age 9 vs. age 11. Research has emphasized the importance of memory in reading (e.g. Just and Carpenter, 1980; Kleiman, 1975; Levy, 1978). However, "no one has been able to find unequivocal evidence that memory deficits operate as causal factors in reading disability" (Doehring, 1981, p.34). Torgeson (1978-1979) has described the difficulty in determining exactly which single process or combination of processes (eg., encoding, retention, and retrieval) is/are related to memory deficits. However, the results of this factor analysis for both 9 and 11 year olds may suggest that Short-Term Memory may be more related to learned tasks, as defined in factor II, as one becomes older. In contrast, Short-Term Memory may be more related to general language ability for the younger group. These findings may be explained by the attention demand hypothesis of Daneman and Carpenter (1980).

In accordance with the attention demand hypothesis, the greater the demand the more attention one must invest. This decreases selective efficiency which is invariably related to higher demands placed on working memory by the task. The effect would be greatly magnified for poor readers if, in fact, their ability to process syntactic-semantic structures epilinguistically has not reached the level achieved by good readers. In addition, the evidence of increased meta-linguistic awareness, with age and reading ability, may also indicate a greater facility with processing information epilinguistically. Thus, the demands placed on working memory (short-term memory) by the 11 year olds should be less than for the 9 year olds. If such is the case, then it would be expected that Short Term Memory to load on Factor I (defined as Generic Meta-linguistic Awareness) for the 9 year olds but not for the 11 year olds. Evidence for this position can also be abstracted from the correlational data. Short-Term Memory correlates as highly with meta-linguistic tasks as with any other tasks for the 9 year old group. Conversely, since the 11 year old does not "stress" memory to the same degree, Short-Term Memory becomes more related to specific learned tasks. In addition, Kleiman (1975) has suggested that semantic integration of a set of words into an intergraded phrase or sentence is invariably related to holding the words into some type of short term buffer storage in which the information is phonetically encoded. In order to fully comprehend the meaning of the phrase or sentence the individual is required to retrieve from each accessed lexical entry the word's phonological code: "...a representation of the phrase in terms of a sequence of phonological codes which exists in the buffer memory and is operated upon when..." (Coltheart, 1980, p.211) the individual attempts to comprehend the phrase or sentence. If such is the case, then great demands would be imposed on short term memory by Sentence Ambiguity and Auditory Phonological Segmentation and Synthesis. Consequently, short term memory should be highly related to meta-linguistic awareness as well as specific tasks related to reading.

Principal factor and principal component analysis were conducted with total scores for Sentence Ambiguity, Interchangeability of Labels, Auditory Phonological Segmentation and Synthesis, Short Term Memory, Morphophonological Knowledge and Definition of a Word. Definition of a Word was included in the analysis, rather than the total score based on Long, Short and Difficult Word, because the intercorrelations among the latter three subtests were low.

Two factors were extracted and rotated, accounting for 98.2% and 97.0% of the total variance for the 9 and 11 year olds, respectively. These promax- and varimax-rotated factor matrices are presented in Table 9 and Table 10, respectively. The interpretations are based on the promax results since factor intercorrelations are .84 and .74 for age 9 and 11, respectively. These results support the findings for the factor analysis based on subtests. Meta-linguistic tasks form one factor (Meta) while Auditory

TABLE 9
PRINCIPAL FACTOR ANALYSIS WITH PROMAX ROTATION OF TOTAL SCORES

TESTS	9 - YEAR OLDS (N = 170)			11 - YEAR OLDS (N = 170)		
	META	SPECIFIC	h2	META	SPECIFIC	h2
Sentence Ambiguities	.722	.190	.787	.536	.332	.660
Definition of a Word	.502	.007	.258	.861	-.094	.630
Interchangeability of Labels	.464	.094	.297	.520	.090	.347
Auditory Phonological Segmentation and Synthesis	-.001	.820	.671	.029	.756	.606
Short Term Memory	.432	.366	.587	-.043	.731	.489
Morphological Knowledge	.136	.599	.514	.087	.535	.362
% of Total Variance	48.83	49.36		45.19	51.78	
% of Common Variance	49.73	50.27		46.60	53.40	

Correlation among the two primary factors was .740

TABLE 10
PRINCIPAL FACTOR ANALYSIS WITH VARIMAX ROTATION OF TOTAL SCORES

TESTS	9 - YEAR OLDS (N = 170)			11 - YEAR OLDS (N = 170)		
	META	SPECIFIC	h2	META	SPECIFIC	h2
Sentence Ambiguities	.729	.502	.787	.624	.520	.660
Definition of a Word	.447	.242	.258	.749	.262	.630
Interchangeability of Labels	.455	.300	.297	.512	.292	.347
Auditory Phonological Segmentation and Synthesis	.398	.716	.671	.332	.704	.606
Short Term Memory	.559	.523	.587	.587	.256	.651
Morphological Knowledge	.411	.587	.514	.290	.524	.362
% of Total Variance	49.77	48.41		46.26	50.70	
% of Common Variance	50.70	49.30		47.71	52.92	

Phonological Segmentation and Synthesis form a second factor (Specific). Short Term Memory loaded with the meta-linguistic tasks for the 9 year olds and on the alternative tasks for the 11 year olds.

The reader should be cautioned that both principal component analysis and a scree test of the eigenvalues from the principal factor analysis suggested a single factor underlying the total scores for 9 year olds. Loadings on the first unrotated principal factor for each age group are provided on Table 11 to allow the reader to compare one- and two-factor solutions. The decision to extract and interpret two factors was based on the following reasons: 1) This decision allowed more direct comparison of results of the two age groups. 2) The varimax- and promax-rotated second factor accounted for 48.4 and 49.4% of the total variance, respectively. Cattell (1978) has adviced the extraction and rotation of a borderline factor particulaly the boarderline loadings account for a large portion of the common variance.

The high intercorrelations between the Meta-linguistic and Specific Tests Related to Reading factors, whether subtests or total scores were analyzed, strongly suggests the presence of a general factor of reading ability. The existence of such a general factor does not preclude the possibility that two seperate processes contribute to the reading achievement of children. The two processes are reflected in the primary factors labeled Meta and Specific.

TABLE 11
PRINCIPAL FACTOR ANALYSIS WITH VARIMAX ROTATION OF TOTAL SCORES
(6 VARIATIONS)

TESTS	9 - YEAR OLDS (N = 170)		11 - YEAR OLDS (N = 170)	
	META	h2	META	h2
Sentence Ambiguities (Jokes)	.874	.764	.806	.646
Definition of a Word	.488	.238	.705	.497
Interchangeability of Labels	.535	.286	.564	.318
Auditory Phonological Segmentation and Synthesis	.786	.618	.740	.548
Short Term Memory	.766	.587	.649	.421
Morphophonological Knowledge	.705	.497	.584	.341
% of Total Variance	94.26		86.97	
% of Common Variance	100.00		100.00	

The following possible conclusions can be extracted as a result of factor analysis and intercorrelations:

1. The three meta-linguistic measures (Sentence Ambiguity, Word Awareness and Interchangeability of Labels) define one factor which was labeled as Generic Meta-linguistic Awareness (Meta). Thus *hypothesis 1 is accepted.*

2. The three specific tasks denoted to be related to instructional intervention formed the second factor. However, this factor included Short Term Memory only for the 11 year olds. Thus *hypothesis 2 is accepted in full for only the 11 year olds.*

3. The second factor (Specific) was basically defined by Auditory Phonological Segmentation and Synthesis for both age groups. Thus, *hypothesis 2a is accepted.*

Analysis of Reading Ability and its Relationship to Meta-linguistic Awareness and Specific Skills Related to Reading

The relevant hypotheses for this section are as follows:

Hypothesis 3. There will be a main effect for reading ability. The four reading groups will be significantly different from each other on both factors. Superior Readers will have the highest score on each factor, followed by Average, Below Average and Significantly Below Average Readers, in turn.

Hypothesis 4. There will be a significant interaction between factor type and reading level. This analysis is somewhat exploratory and therefore the direction of the interaction is not specified.

The following analysis was conducted to determine whether different reading ability groups can be differentiated on meta-linguistic ability and/or performance on specific tasks related to reading. Factor scores were derived for each age sample from the factor structure matrices corresponding to the pattern matrices in Table 7. The scores on each factor were arbitrarily scaled to means of 50 and standard deviations of 10 for each age group. The means and standard deviation for the factors are presented in Tables 12, 13, 14, and 15. A two-way analysis of variance

TABLE 12
MEANS AND STANDARD DEVIATIONS ON META-LINGUISTIC SCORES FOR 9 - YEAR OLDS

GROUPS	N	MEANS	SD
Superior Readers	50	60.29	5.41
Average Readers	40	50.86	5.37
Below Average Readers	40	48.01	6.72
Signif. Below Average Readers	40	38.27	6.60

TABLE 13
MEANS AND STANDARD DEVIATIONS ON SCORES OF SPECIFIC TASKS RELATED TO READING SCORES FOR 9 - YEAR OLDS

GROUPS	N	MEANS	SD
Superior Readers	50	58.26	2.85
Average Readers	40	52.62	5.53
Below Average Readers	40	48.84	6.84
Signif. Below Average Readers	40	38.22	10.50

TABLE 14
MEANS AND STANDARD DEVIATIONS
ON META-LINGUISTIC SCORES FOR 11 - YEAR OLDS

GROUPS	N	MEANS	SD
Superior Readers	50	63.37	3.86
Average Readers	40	47.24	3.66
Below Average Readers	40	43.86	4.05
Signif. Below Average Readers	40	42.20	7.04

TABLE 15
MEANS AND STANDARD DEVIATIONS
ON SPECIFIC TASKS RELATED TO
READING SCORES FOR 11 - YEAR OLDS

GROUPS	N	MEANS	SD
Superior Readers	50	57.48	5.88
Average Readers	40	52.75	5.81
Below Average Readers	40	45.12	8.62
Signif. Below Average Readers	40	42.79	11.28

was conducted for each age group. Reading comprised the first independent variable, with the four levels of this independent variable. The two factors, Meta and Specific, comprised the two levels of the second independent variable. Thus, the experimental design was a 4x2 ANOVA with repeated measures on the second independent variable (factor). The dependent variables were factor scores for the two factors. The rationale for conducting a two-way analysis of variance, as opposed to two separate one-way ANOVAS on the two sets of factor scores, is that the interaction effect allows the researcher to detect differences across factor in their power to distinguish the reading level groups. Since the overall means on scores on the two factors were scaled to the same value, the main effect for types of factor is meaningless. The main effect for reading groups is of theoretical interest, although its meaningfulness would be limited by a significant interaction.

The summary table for the two-way ANOVAS for age 9 is presented in Table 16. There was a significant main effect for reading level (F=108.336, df=3,166, p<.001). This indicates differences in factor score means among the reading level groups. As expected, because of scaling, the main effect for factor type was nonsignificant. The interaction effect was also nonsignificant, suggesting that the trends in group differences were similar for the two factors.

TABLE 16
TWO WAY ANALYSIS OF VARIANCE ON FACTOR SCORES FOR 9-YEAR OLDS
(TYPE OF FACTOR BY READING LEVEL)

SOURCE	DEGREES OF FREEDOM	MEAN SQUARES	F RATIO	P
A - Reading Level	3	6409.758	108.336	.001
S - Within	166	59.166		
B - Factor Type	1	1.316	0.056	.813
AB - Interaction	3	55.318	2.354	.074
BS - Within	166	23.501		

Type of factor = meta-linguistic vs specific

Post hoc tests were conducted to identify those specific group differences which resulted in the significant group effect. These Post hoc tests were conducted from the group means for individual factors rather than a combination of the factors scores, since individual factors are of greater theoretical interest. Pairwise comparisons between group means were tested with Tukey's multiple range test. The results of these comparisons are provided in Table 17.

The most important features of the pattern of pairwise comparison results are as follows:

1. Superior Readers excel all other groups in meta-linguistic ability. Average and Below Average Readers are not differentiated on meta-linguistic skills but excel Significantly Below Average Readers on this ability.

2. Superior Readers excel all other groups in specific skills related to reading. Average readers excel both of the remaining two groups on specific skills related to reading and Below Average readers excel Significantly Below Average Readers in turn.

3. There are no differences between mean scores on meta-linguistic ability and specific skills related to reading within any one reading group. The parallelism of trends and group differences on each of the two factors is illustrated in Figure 1.

Overall these results indicate that ability in meta-linguistic awareness and specific skills related to reading are differentiated among groups of 9 year-old

TABLE 17
POST HOC COMPARISONS ON FACTOR SCORE MEANS FOR 9-YEAR OLDS (META-LINGUISTIC AND SPECIFIC SKILLS)

GROUPS RANKED	8	4	3	7	2	6	5	1
MEANS	38.22	38.27	48.01	48.84	50.86	52.62	58.26	60.29
8			*	*	*	*	*	*
4			*	*	*	*	*	*
3						*	*	*
7						*	*	*
2							*	*
6							*	*
5								

* P < .05

GROUPS:
1. Superior Readers (Meta-Linguistic Ability
2. Average Readers (Meta-Linguistic Ability)
3. Below Average Readers (Meta-Linguistic Ability)
4. Significantly Below Average Readers (Meta Linguistic Ability)

5. Superior Readers (Specific Skills Related to Reading)
6. Average Readers (Specific Skills Related to Reading)
7. Below Average Readers (Specific Skills Related to Reading)
8. Significantly Below Average Readers (Specific Skills Related to Reading)

FIG. 1

FIG. 1A

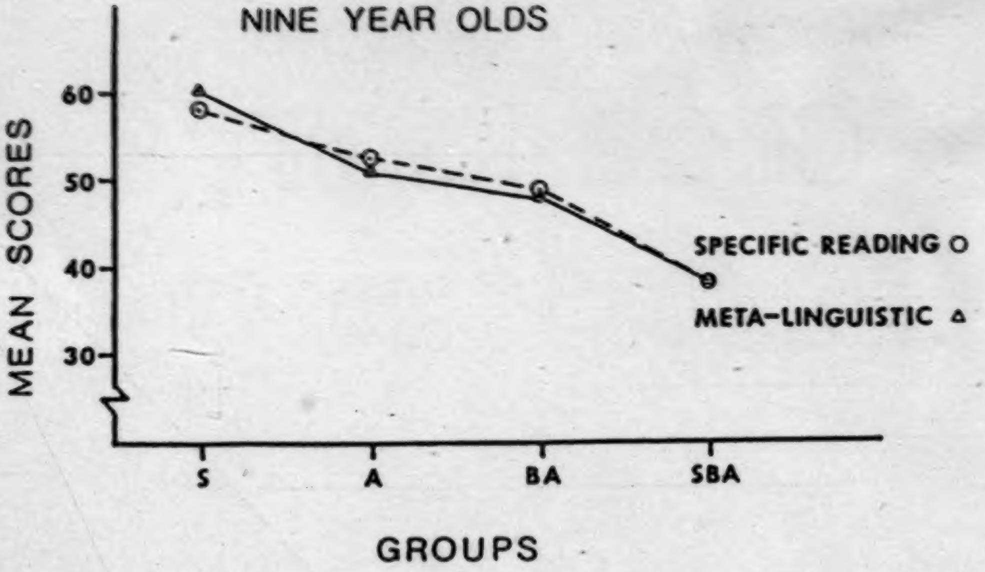
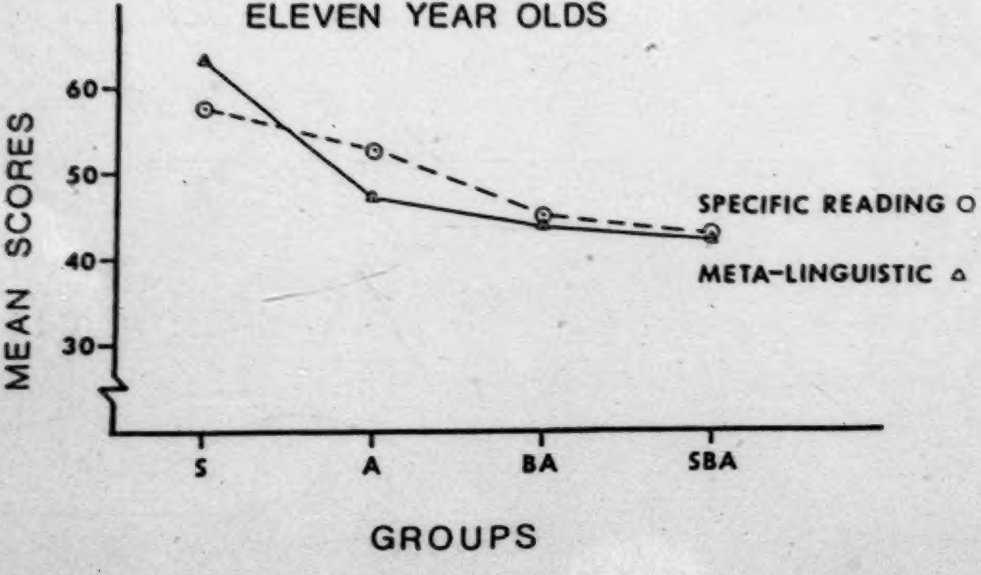


FIG. 1B



Performance on Meta-linguistic and Specific Reading Skills of 4 Reading Level Groups at ages 9 (Fig. 1A) and 11 (Fig. 1B) children of various reading ability levels.

The summary for the two-way ANOVA for age 11 is presented in Table 18. There was a significant main effect for reading level (F=86.891, df=3,166, p<.001). This indicates differences in factor score means among the reading level groups. The effect of factor type was nonsignificant. The interaction between effect for reading level and factor type was significant (F=17.963, df=3,166, p<.001). This indicates that the trends in group differences were not similar across the two factors.

Post hoc tests were conducted to determine the nature of the group x factor interaction. Pairwise comparisons of factor score means were tested with Tukey's multiple range test. The results of these comparisons are provided in Table 19.

The main features of the pattern of pairwise comparison results are as follows:

1. Superior Readers excel Average Readers in meta-linguistic abilities. Average Readers excel both Below Average and Significantly Below Average Readers on this factor. The latter two groups do not differ significantly on this factor.

2. The pattern of group differences in specific skills related to reading is identical to the pattern for meta-linguistic abilities, as described in point 1 above.

3. The mean meta-linguistic ability score for Superior Readers was significantly higher than the group's mean score

TABLE 18
TWO WAY ANALYSIS OF VARIANCE ON FACTOR SCORES FOR 11-YEAR OLDS
(TYPE OF FACTOR BY READING LEVEL)

SOURCE	DEGREES OF FREEDOM	MEAN SQUARES	F RATIO	P
A - Reading Level	3	5435.469	86.891	.001
S - Within	166	62.555		
B - Factor Type	1	11.349	0.438	.509
AB - Interaction	3	465.790	17.963	.001
BS - Within	166	25.931		

Type of factor = meta-linguistic vs specific

TABLE 19
POST HOC COMPARISONS ON FACTOR SCORE MEANS FOR 11-YEAR OLDS (META-LINGUISTIC AND SPECIFIC SKILLS)

GROUPS RANKED		4	8	3	7	2	6	5	1
	MEANS	42.20	42.79	43.86	45.12	47.24	52.75	57.48	63.37
4						*	*	*	*
8						*	*	*	*
3						*	*	*	*
7							*	*	*
2							*	*	*
6							*	*	*
5									*

* P < .05

GROUPS:
1. Superior Readers (Meta-Linguistic Ability
2. Average Readers (Meta-Linguistic Ability)
3. Below Average Readers (Meta-Linguistic Ability)
4. Significantly Below Average Readers (Meta Linguistic Ability)

5. Superior Readers (Specific Skills Related to Reading)
6. Average Readers (Specific Skills Related to Reading)
7. Below Average Readers (Specific Skills Related to Reading)
8. Significantly Below Average Readers (Specific Skills Related to Reading)

on specific skills related to reading. In contrast, the mean meta-linguistic ability score of the Average readers was significantly lower than the mean score on specific reading skills for that group. Such within-group differences had not been obtained with the 9 year-old sample. In contrasting direction of these differences for the two reading ability levels suggests that this pattern of results contributed to the significant interaction effect in the main ANOVA for this age group. One further Post hoc test was conducted to test this hypothesis. Differences between the means of Average and Superior Readers were calculated for each meta-linguistic and specific reading skills and these differences were contrasted. The significance of this contrast was tested with Scheffe's test for pairwise comparisons and found to be significant (F=56.38, df=3,166, p<.01). As illustrated in Figure 1B, mean differences between Superior and Average Readers on meta-linguistic abilities are significantly larger than the corresponding difference on specific skills related to reading. These results indicate that Superior Readers are perhaps more strongly differentiated from Average Readers on the basis of meta-linguistic ability than on the basis of specific reading skills.

Examination of the mean on each factor suggested the possibility of an interaction involving the Average and Below Average groups at 11 years of age. To test whether the gap between the groups was larger on the Specific factor than on Meta (meta-linguistic) factor, a Scheffe pairwise comparison was conducted. The results of this comparison was not significant. (F=6.94, df=3,166, p>.05). The significant interaction obtained in the main analysis appears to be solely due to the disordinal interaction involving Superior and Average Readers described above.

The following possible conclusions can be extracted from the results of the statistical analyses: 1)*Hypothesis 3* is partially accepted as the main effect for reading level was significant for both 9 year olds (F=108.336, df=3,166, p<.01) and for 11 year olds (F=86.891, df=3,166, p<.01). The groups were ranked in the order expected but Post hoc analyses indicated no differences between Below Average and Significantly Below Average Readers on the Meta (meta-linguistic) factor at either ages of 9 and 11 years. These two groups (Below and Significantly Below Average Readers) did not differ on specific skills related to reading at age 11.

2)*Hypothesis 4* was rejected at the 9 year level (F=2.354, df=3,166, p>.05). This hypothesis was confirmed for the 11 year olds (F=17.963, df=3,166, p<.01). Post hoc analysis indicated that the separation between factor score means of Superior and Average Readers was greater on the Meta (meta-linguistic) factor than on the Specific (specific skills related to reading) factor.

To provided further clarification of the data a qualitative analysis was conducted examining observations made with respect to the children's verbal responses to the tasks. The following section will provide a brief overview of this data.

Responses to Meta-linguistic tasks

It is felt that children's responses to the meta-linguistic tasks provide an insight into their uderstanding of words and language in general. The tasks, with the exception of the Word Definition Task, required all subjects to provide examples and justification for their responses.

Children's (7 years old SR, 9BA, 9SBA and 11SBA) responses to Short and Long Word appeared to be related to the graphic representation of the signifier. A word is "long" simply as a result of the number of letters it contained, and, conversely, it is "short" because of the number of letters it contains. It is indeed noteworthy that children, prior to dichotomizing the word/referent relationship, accompany their justifications with restrictions which focus upon the quantitative aspect of the referent. For example:

What is a long word? (question phrased to a 7 year old SR).

Response: *ENCYCLOPEDIA*

Question: **Why is encyclopedia a long word?**

Response:

> *BECAUSE IT HAS LOTS OF LETTERS 5 OF THEM EN - CY - CLO - PE - DIA. AND BECAUSE THE ENCYCLOPEDIA HAS SO MANY BOOKS AND SO MUCH INFORMATION THAT IT TAKES A LONG TIME TO LEARN.*

It seems that these children are at the transition stage of dichotomizing or differentiating words from the physical reality they represent. By contrast, the 9 year old SR, 11 year old SR and 11 year old A reader's facility and higher level understanding of words is perhaps best exemplified by the following play on words:

Question: **Can you give an example of a long word:**

Response: *SMILE*

Question: **Why is smile a long word?**

Response: *BECAUSE IT HAS A MILE AT THE END.*

Children were also requested to provide examples of difficult words and to justify their answer.

Question:**Difficult word:** The (7SR, 9BA, 9SBA, 11SBA) childrens' responses are based on the fact that they are experiencing difficulty in spelling words. For example:

Response: *BELL, I ALLWAYS FORGET TO PUT 2 'Ls'.*

While this is a very justifiable explanation, it is related to the individual's ability and may not related to the complexity of the word itself. However, the complexity of the task relative to the individual's skills and abilities must be comsidered.

The higher ability groups (9SR, 9A, 11SR, 11A) provided higher order justifications by using grammatical terms and demonstrated an understanding that these terms are part of subsets. For example:

Question: **What is a difficult word:** (9 year old SR)

Response:*PNEUMONIA ... IT IS DIFFICULT TO SPELL BECAUSE THE FIRST SYLLABLE "P" IS SILENT AND THE SECOND VOWEL "U" IS ALSO SILENT.*

Question: **What is a difficult word: (11 year old SR)**

Response: *WORDS LIKE "RETURNED" BECAUSE THEY CAN BE USED AS ADJECTIVES OR VERBS.*

Question: **can you give me an example?**

Responses: *ADJECTIVE: THE RETURNED BOOK SAT ON HIS DESK*

VERB: HE RETURNED THE BOOK TO THE LIBRARY.

Inconsistencies are again observed within the 9 year old SR and the 9 year old A readers. In their definition of a word their responses seemed to be more abstract than those of the 7 year old SR. Nevertheless, remnants of concreteness were observed. By contrast, their performance on Long, Short and Difficult Word tasks indicated a considerable degree of linguistic sophistication. These differences could be explained by the characteristic nature of the questions themselves. The question *"WHAT IS A WORD"* is a very abstract and difficult question. In fact, in a personal communication, Dr. Peter Bryant (1982) reported that a philosopher at Oxford University had difficulty in providing a definition of a word. Providing examples of a Long, Short and Difficult word in comparison to defining a word, is a much easier task since it is less open ended, more concrete and taps physical attributes of words. Justifications for the chosen word can be abstracted from learned information. These observations provided added justifications for the previously stated notion that these tasks are not pure measures of generic meta-linguistic awareness.

A further aspect worthy of comment is the performance of the three Superior Reading groups on Definition of a Word Task and Intercheangability of Labels Task. These two tasks require the individual to look *at* language, to *know* and not just *respond* and to use language abstractly. The responses of the 7 and 9 year olds SRs did not appear to differ significantly. Their responses on the whole tended to be somewhat unanalyzed, iconic and situational bound. Both groups offered as a definition of a word *"MEANING: A WORD MEANS SOMETHING* or *A WORD TELLS YOU SOMETHING."* These children rejected articles and other functors as examples of words since *"THEY DON'T MEAN ANYTHING."* Similarly, when asked to respond to the question: *suppose someone was making up names for things, could he then call the sun THE MOON and the moon the SUN?* The majority of the 7 year olds responded with: *"NO....BECAUSE THE MOON DOES NOT SHINE LIKE THE SUN."* When asked *what would night look like* their answer was invariably *"BRIGHT"*. By way of contrast, the 9 year old SR responded to the first question with such affirmative responses as *IF YOU WANT TO, I GUESS IT'S OK. BUT YOU REALLY SHOULD NOT BECAUSE THEY ALREADY HAVE NAMES* or *IT'S OK IF YOU'RE AN INVENTOR* or *IT'S OK TO JUST PRETEND*. However, their responses to *what would night look like* was also *BRIGHT*. It appears that the concept of 'wordness' is more crystallized in the 9 year old SR than in the 7 year old SR. However, when the 9 year old was placed in a decision making process which violated their experiences (e.g., attributes of night vs attributes of day) they fell into the trap of not being able to seperate the name of the object from its attribute. As Vygotsky (1962) has noted "they cling to the name when it is transferred like possessions following their owner" (p.129). Vygotsky's hypothesis is perhaps best exemplified by a 9 year old's SBA response to the question **.........could he then call a cat a dog and a dog a cat,** was *"NO OF COURSE NOT! THE CAT WOULD THEN HAVE TO CHASE THE DOG."* Again, as evidenced above the 7 year olds, similar to the 9 year old SBA readers are yet unable to appreciate the semantic structure of a word since they have difficulty in distinguishing between referent and meaning. By way of contrast, the 9 year old Superior Readers have to some extent overcome this difficulty. The concepts for them are evolving but are not fully at their command.

The 11 year olds,(SR) on the other hand, appear to have overcome this difficulty and can treat words abstractly and symbollically. For example, in defining words they offered the following: *WORDS ARE PART OF A SENTENCE AND WITHIN THE SENTENCE THEY HAVE MEANING LIKE.. IT.. THE.. ETC...WORDS ARE ALSO PART OF GRAMMAR (ADJECTIVES, NOUNS, ADVERBS, PREPOSITIONS, ARTICLES ETC...WORDS PROVIDE INFORMATION AND DISCRIPTIONS OF THINGS. THEY HELP US TO COMMUNICATE. WORDS ARE MADE UP OF LETTERS......SOME ARE VOWELS AND SOME ARE SYLLABLES.* As can be seen, words have become more differentiated, abstract and *opaque* at this age. Similar findings have also been reported by Berthoud -

Papandropoulou (1978). However, the Average readers were not able (generally speaking) to provide such an all encompassing definition. The general trend was to provide a defination such as: *WORDS GIVE MEANING, YOU CAN WRITE WITH THEM AND MAKE SENTENCES, YOU CAN SPEAK WITH THEM. WORDS ARE USED FOR GRAMMAR.*

Question: **is the a word?**

ANSWER: after a long pause *YES, BECAUSE IT'S AN ARTICLE.*

The SBA and BA readers seldom provided parsimonious definitions and basically gave meaning as a definition.

Intuitive knowledge of spoken language and comprehension of that language is highly related to academic success and in particular to reading. This is based on the idea that schooling is primarily a reading processs and reading is a language oriented skill (Vellutino, 1978). In addition, language is the primary medium in which teachers teach and children learn. Therefore, unless the individual possesses the necessary linguistic skills to understand language, schooling may be fruitless. Flood and Salus (1982) suggest that "Less obvious is the fact that the ability to think and talk about language (a meta-linguistic task) is critical to successful academic achievement in terms of learning and providing evidence of this learning" (p.57).

If the reading process is related to the process of consciously manipulating the different categories and relations in language (a meta-linguistic ability) and if reading requires the individual to stand back and analyze language objectively (Menyuk and Flood, 1981) then awareness of Ambiguities in Sentences, Word Definition and Intercheangability of Labels must also play a role in reading acquisition. After all, a pre requisite of reading can be thought of as a meta-linguistic process in which the individual is required to extract information from visually presented materials. In addition, if the ability to read is invariably related to complete relations between the "psycholinguistic processing of printed materials and oral syntactic meta-linguistic abilities , then, diferrences in these abilities could account for the differences in reading achievement among children" (Flood and Salus, 1982, p. 61).

It was noted, from the observational data, that the amount of time required to respond and obtain a correct response increased as the ability level decreased. In addition, it was also noted that the amount of qualitative information (precise and to the point), decreased as a function of lower ability levels. The following example is indicative of the type of responses provided by poor readers (9 year old Significantly Below Average):

Question:*WHAT SIGNS SHOULD BE USED IN A FROZEN FOOD DEPARTMENT?*

THE BEST FOODS YOU EVER THAW.

Response: **FROZEN FOOD DEPARTMENT, I GUESS THAT'S A PLACE LIKE SAFEWAY, YOU KNOW WHERE YOU FIND ICE CREAM, AND PIZZA. I REALLY LIKE MAC CAINS PIZZA, THEY PUT A LOT OF STUFF ON THEIR PIZZA LIKE LOTS OF CHEESE.**

Question:*THAT'S RIGHT BUT WHAT DOES THE JOKE MEAN?*

Response: **WHAT WAS THAT JOKE AGAIN?**

The joke was repeated.

Response: **THE FOOD IN A FROZEN FOOD DEPARTMENT IS FROZEN AND IF THE FRIDGES BREAK THE FOOD WILL THAW. RIGHT? OH! WAIT A MOMENT, SAW AND THAW ARE ALMOST THE SAME THEY SOUND ALIKE. NO, THE JOKE WAS NOT THAT FUNNY.**

The 11 year old Significantly Below Average Readers responses were not as embellished with irrelevant information, as were their 9 year old counterparts. Nevertheless the responses were not as precise and parsimonious as those of the 11 year old Superior Reader.

For example: **THAW AND SAW ARE VERY SIMILAR SOUNDING WORDS, IT'S A PLAY ON WORDS.**

In summary, it seems that the lower ability groups utilize a strategic behavior of trial and error which finally lead to success. These results suggest that meta-linguistic abilities are present in the lower ability groups but may not be as 'automatized' as in the higher ability groups. The lower ability groups may lack the awareness of how to employ, immediately, appropriate resources or strategies in order to obtain the ultimate response or level of performance. This hypothesis has received considerable attention and consistency in its findings dealing with memory (Brown, 1975; Chi, 1976) and meta-linguistic awareness (Hakes, 1980). The result of the above studies indicate that over the course of development, increased performance is related to more effective use by the individual, of his limited resources via greater awareness and more efficient use of strategies for efficient information processing (Chi, 1976; Dennis, 1982; Forrester and Waller, 1976). It is important to emphasize that all of the tasks adopted in this study were orally presented and thus they emphasize oral language processing (listening/speaking). This mode of presentation, coupled with the fact that they were allotted as much time as required, might have afforded the poor readers with the opportunity to employ what ever meta-linguistic ability they possess in order to provide the appropriate judgement or response. Similar findings have also been reported by Menyuk and Flood (1981).

V. General Discussion

The present study attempted to identify the factors underlying a group of tasks which measured skills believed to be important to reading. Tests believed to measure meta-linguistic ability and specific skills related to reading appeared on separate factors, labelled Generic Meta-linguistic Ability and Specific Skills Related to Reading, for both 9 and 11 year-old children. However, the evidence for the significance of a separate meta-linguistic factor was much weaker at the 9 year-old level than at the 11 year-old level. In fact, there was direct evidence from principal component analysis on total scores for a single general factor underlying reading abilities.

This study indicates that researchers need to be more cognizant of the tasks they use to measure meta-linguistic awareness. For example: Auditory Phonological Segmentation and Synthesis, which has been used as a meta-linguistic task since it requires the child to think about the language he/she uses unconsciously everyday, was found to be a poor measure of generic meta-linguistic awareness. Thus, tasks should be analyzed, age and different ability levels should be considered.

Within the context of this study, the results indicate that two distinct factors emerged - a Meta and a Specific factor especially for the 11 year old group. This seems to suggest that meta-linguistic awareness is not just an all encompassing process, with respect to reading, but is rather a cognitive construct which interacts with other cognitive activities with which it can modify. Thus, it can be modified and can modify other cognitive activities. In addition, a significant interaction was found between the 11 year old Superior and Average readers. It seems that for the 9 year old both meta-linguistic abilities and knowledge of specific skills are necessary for reading.

The 11 year old Superior and Average readers were differentiated only by meta-linguistic ability. This may suggest that meta-linguistic ability is perhaps important not only for acquiring reading but also for a higher conceptual level in reading such as comprehension. Thus, meta-linguistic awareness, for this age group, would be more related to the 'how' and the the 'why' of certain interactions. This, of course, does not imply that younger children are incapable of interpreting the 'how' and the 'why' relationships. Perhaps younger children are more concerned with the 'how' and the 'why' of specific actions and not so concerned with certain interactions (Sinclair, 1978).

Factor scores on both the meta-linguistic and specific skills factors were able to discriminate children of various levels of reading comprehension abilities. At the 9 year level, the trend on factor score means of Superior, Average, Below Average, and Significantly Below Average Readers reflected an almost linear relationship between reading comprehension and each of meta-linguistic ability and specific skills related to reading. These two factors do not differ in their ability to discriminate among reading levels, as reflected by the lack of a significant interaction in the factor type by reading level ANOVA for 9 year-olds. In contrast, the significant interaction on the corresponding ANOVA for 11 year-old children reflect differences in the power of these factors to discriminate children of various levels of reading ability. Superior Readers could be more clearly seperated from Average Readers by meta-linguistic abilities than by specific skills related to reading. A tentative interpretation of the differences and results obtained for the two age groups is provided below.

The stronger evidence for the significance of a separate meta-linguistic factor and it superior power in discriminating between Superior and Average Readers at age 11 may reflect over learning and automaticity of the specific skills at that age level and/or cognitive maturation leading to the refinement of meta-linguistic skills of Superior Readers. In other words, children's performance on such specific tasks such as pluralizing a word may become automatized. In contrast children's cognitive capability for such abstract tasks as the meta-linguistic tasks become refined and increasingly differentiated as age increases. The rationale for this interpretation is as follows: Both specific skills and meta-linguistic abilities are related to reading at both age levels as reflected by group differences on both factors at both age groups. However, the variance in reading ability may be more strongly influenced by variance in meta-linguistic abilities than by variance in specific skill at age 11. Evidence for a stronger role played by meta-linguistic abilities is supplied by the significant interaction between factor type and reading level. Support for the above interpretation is available from Messik (1972). He argued that complex tasks involve a number of components and abilities which may be executed sequentially throughout task performance. That is to say that some components are more difficult to master than other components and are thus mastered at later ages. The importance of ability on any one particular component to ability on the complex task, may change as a function of practice or exposure to the component task. This phenomenon has been demonstrated in regards to the importance of applying chunking strategies to memory span tasks (Dempster, 1981) and the relative importance of visualization and physical or motor co-ordination to performance on psychomotor tasks (Fleshman, cited in Messik, 1971).

The above interpretation of results of the present study can only be offered as hypotheses to be tested by further research. These hypotheses cannot be tested directly by the procedures used in the present study. These procedures were all essentially correlational. Consequently, causal statements about the effect of development of abilities on component skills cannot be made. Factor analysis is a procedure for simplifying patterns of correlations among variables.

Messik (1972) has argued that whereas factor analysis is valuable for identifying ability of personality traits it is not capable of specifying the nature of the trait. He has suggested that factor interpretation may be aided by multivariate studies in which factors or traits are experimentally manipulated. In fact, Royer (1963) has suggested that one can either manipulate the factors or traits directly as independent variables or indirectly as dependent variables via manipulation of a true independent variable.

Further research should attempt to examine the above presented hypothesis regarding meta-linguistic skills through further experimental manipulation of meta-linguistic abilities and specific skills related to reading.

Prior to experimentally manipulating meta-linguistic awareness and specfic tasks related to reading a number of condiderations should be addressed:

1) Research should endevour to task analyze any experimental tool , or task utilized to measure meta-linguistic awareness. This process should facilitate not only an indepth understanding of meta-linguistic awareness but also assist in determining the degree to which meta-linguistic awareness is being measured. In addition this procedure should assist in controlling for or

understanding any extraneous variables.

2) With due regard to extraneous variables or covarying factors it would be useful to investigate the influence of formal and informal educational experiences on meta-linguistic awareness.

3) In order to specifically determine the relationship between meta-linguistic awareness and reading, a systematic investigation would require training in meta-linguistic awareness. This procedure, while adopting appropriate methodological approaches, would permit a greater understanding into the experimental variables and how they are related to the performance characteristics on various intellectual tasks (e.g., reading comprehension, understanding expressive and receptive language).

4) An additional area worthy of exploration is to examine meta-linguistic awareness within different ages in both "normal" and exceptional populations. Untill there is evidence of a definite relationship between reading and meta-linguistic awareness and evidence for a wide-spread application of meta-linguistic skills the application of the concept meta-language would seriously be called into question.

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APPENDIX A: DESCRIPTION OF TASKS

WORD AWARENESS TASK

Q. 1) CAN YOU TELL ME WHAT A WORD IS?

Q. 2) CAN YOU TELL ME A WORD THAT IS LONG?

Q. 3) WHY IS (the name of the word the child said) A LONG WORD?

Q. 4) CAN YOU TELL ME A WORD THAT IS SHORT?

Q. 5) WHY IS (the name of the word the child said) A LONG WORD?

Q. 6) CAN YOU TELL ME A WORD THAT IS DIFFICULT?

Q. 7) WHY IS (the word the child said) A DIFFICULT WORD?

INTERCHANGEABILITY OF WORDS TASK

Q. 1) SUPPOSE SOMEONE WAS MAKING UP NAMES FOR THINGS COULD HE THEN CALL THE SUN *THE MOON* AND THE MOON *THE SUN*? WHY OR WHY NOT?

Q. 1A) WHAT WOULD NIGHT LOOK LIKE?

Q. 2) SUPPOSE SOMEONE WAS MAKING UP NAMES FOR THINGS COULD HE THEN CALL A CAT *A DOG* AND A DOG *A CAT*. WHY OR WHY NOT?

Q. 2A) WHAT SOUND WOULD A CAT MAKE?

Q. 3) SUPPOSE SOMEONE WAS MAKING UP NAMES FOR THINGS COULD HE THEN CALL A BOOK *A CHAIR* AND A CHAIR *A BOOK?* WHY OR WHY NOT?

Q. 3A) WHAT WOULD A BOOK LOOK LIKE?

Q. 4) SUPPOSE SOMEONE WAS MAKING UP NAMES FOR THINGS COULD HE THEN CALL A LAKE *A TREE* AND A TREE *A LAKE*. WHY OR WHY NOT?

. WHAT WOULD A TREE LOOK LIKE?

INSTRUCTION FOR THE "JOKE" TEST

I HEAR YOU LIKE JOKES. IS THAT TRUE? If yes say GOOD. If no is the answer say WELL I HAVE SOME GOOD ONES. WOULD YPOU LIKE TO HEAR THEM. Encourage the child to participate. SOME PEOPLE HAVE TOLD ME THAT SOME OF THE JOKES ARE VERY GOOD AND THAT SOME OF THEM ARE REALLY BAD. I CANNOT TELL WHICH ARE THE GOOD ONES AND WHICH ARE THE BAD ONES. I NEED YOUR HELP. WOULD YPOU LISTEN TO THE JOKES AND TELL ME IF YOU THINK IT'S REALLY FUNNY, A LITTLE FUNNY OR NOT FUNNY AT ALL?

At this point the child is given an example. *WHY DID THE CHICKEN CROSS THE STREET. WELL IT WANTED TO GET TO THE OTHER SIDE*. WAS THIS JOKE VERRY FUNNY, A LITTLE FUNNY OR NOT FUNNY AT ALL?

OK. NOW HOW WOULD YOU EXPLAIN THIS JOKE TO SOMEONE WHO DOESN'T GET IT? After the child responds say OK. DO YOU UNDERSTAND HOW WE DO IT? REMEMBER THIS IS NOT A TEST, I REALLY NEED YOUR HELP. ARE YOU READY?

At this point procede with item # 1 of the test and continue. Aloow the child all the time he/she requires.

PHONOLOGICAL AMBIGUITIES

Those cases in which two words share similar phonetic representation, but in which the words differ on at least one phonetic demention. The two words can differ in any of the following respects: different stress; different intonation; different initial, middle of final consonant clusters; different initial, middle or final vowel sounds (*trees/trays*); and addition or deletion of a phoneme or of a phoneme cluster (*hamburglar*). (The following list is restricted to differences in the initial, middle or final consonants or consonant clusters so as to prevent any intraclass interference). A. Bob coughed until his face turned blue.

-- *Was he chocking?*

No, he was serious.

B. What signs should be used in a frozen food department?

-- *The best foods you ever thaw.*

C. What did the mother ghost say to the baby ghost?

-- *Fasyten your sheet belt.*

D. I'll bet you can't tell me what a twip is.

-- *A twip is a ride on a train.*

E. How are doing with your wood carving?

-- *Oh, it's coming whittle by whittle.*

F. How far can a spook travel?

-- *From ghost to ghost.*

G. What is a good way to get a dog off the street?

-- *Put him in a barking lot*

H. Knock Knock

-- *Who'se there? Adolf.*

-- *Adolf who? A dolf ball hit me in the mouth.*

I. If you put three ducks in a box, what do you have?

-- *A box of quackers.*

J. What do you use to treat a pig with a sore throat?

-- *Oinkment.*

LEXICAL AMBIGUITY

Those cases in which the ambiguity rests in the dual interpretation of a single word or group of words There seems to be two classes of lexical ambiguity which affect perception time; those which have systematic relation to one onother and those which do not. For example: *The captain enjoyed his new position,* representing his former type, with, *The bark frighttened him* representing the latter where *bark* used in this context has no relation to the bark of a tree.

As a control here, only examples of the latter will be used -- words which seem to have distinct lexical entries.

A. How can hunters in the woods best find their lost dogs?

-- *By putting their ears to a tree and listening to the bark.*

B. Why isn't your nose twelve inches long?

-- *Because then it would be a foot.*

C. Did you hear about the man who wore a winter coat to a baseball game . because he heard that all the fans would be there?

D. Eye Doctor: Eye's checked?

-- *Betsy: No, they are blue.*

F. What do you do if you smash your toe?

-- *Call a tow truck.*

G. Customer: What are these pennies doing in my soup?

-- *WAITER: Well sir, you said that you would stop eating here if there wasn't some change in your meal.*

H. How do we know that there was fruit on Noah's Ark?

-- *Because the animals came in pairs.*

I. What is the biggest diamond in the world?

-- *A baseball diamond.*

J. MOVIE DIRECTOR TO ACTOR: Do you have any experience in acting?

-- *ACTOR: Sure, my leg was in a cast once.*

K. CUSTOMER IN A SHOP: This record has a dent in it.

-- *CLERK: Then it must have been a hit record.*

L. When is a piece of wood like the king of England?

When it's a ruller.

SURFACE STRUCTURE AMBIGUITIES

Those ambiguities caused by the manner in which the words of a sentence are grouped into phrases.

A. How would you run over a dinosaur?

-- I'd start at his tail, run up his back, then over his neck and I'd jump off.

B. Where would you go to see a man - eating fish?

A seafood restaurant.

C. CLERK: May I help you madame?

-- WOMAN: Have you any wallpaper that I can put on myself? CLERK: No, Ma'am we only have wallpaper that you can put on walls.

D. Why is a bananna like a sweater?

-- Because you can slip on it.

E. When my father went hunting last year, he shot a bear in his pajamas. But, I can't figure out how the bear got into my father's pajamas.

F. Do you have any stamps that I can put on myself?

-- CLERK: We only have stamps that you can put on letters.

DEEP STRUCTURE AMBIGUITIES

Those ambiguities which arise due to a single surface representation for two deep structures.

A. They tell me that your son is quite an author - and still in college. Does he write for money?

-- *Indeed yes, in every letter.*

B. LIBRARIAN: Please be quiet the people near you can't read.

-- *SMALL BOY: Why they ought to be ashamed of themselves! I've been able to read since I was six.*

C. I had my radio on last night.

-- *Did it fit?*

D. This woman's son was away in the army and rote her that he had grown another foot. And she knit him another sock.

E. TEACHER: Billy, you missed school yesterday, didn't you?

-- *BILLY: Not a bit.*

F. God bless America.......

-- *Did it sneeze?*

G. My father makes faces all day.

-- *Why does he do that?* Because he works in a clock factory.

H. Will you join me in a bowl of soup?

-- *Do you think ther's room for both of us?*

I. Did you take a bath today?

-- *No, is there one missing?*

J. We're going to have a preature for Thanksgiving.

-- *You are? Well, we're going to have a turkey.*

K. MOE: Did you hear what happened at Woodwards?

-- *JOE: Na! What happened?* MOE: A boy broke a window with his little brother.

-- *JOE: Oh my, was the little boy hurt?*

MORPHEME SEGMENTATION PROBLEMS with no phonetic distortion.

Those ambiguities which are caused by a separation of a compound syllabic structure into its components or by fusion of two or more morphemes into a compound syllabic structure. Separation and combination yield the phonetic effects of different stress patterns, intonation and time intervals.

A. What did the Indian boy say when his dog fell off the cliff?

-- *Why doggone of course.*

B. What did one hat say to the other hat?

-- *You stay here, I'll go on ahead.*

C. Did you ever stand on a pet?

-- *Stand on a pet? I should say not.* I have, on a carpet. D. Why did the little girl go to the football game? Because she thought that the quarterback would make her rich.

E. Why can one never starve in the desert? Because of the sand which is there.

F. What do you call a cat who drinks lemonade?

-- *A sour puss.*

G. How do trains hear?

-- *Through their engine ears.*

H. What is the difference between a tunafish and a piano?

-- *You can tune a piano, but you can't tune a fish.*

I. Who was the father of all jokes?

-- *Popcorn.*

J. Why is that dog running in a circle?

-- It's a watchdog, and it's winding itself up.

K. Did you hear about the boy who sat in the living room because he thought that he was dying.

INSTRUCTION FOR THE SHORT TERM MEMORY TASK

I'M TO SAY SOME SENTENCES, LISTEN CAREFULLY, AND WHEN I AM THROUGH SAYING YHR SENTENCES I'D LIKE YOU TO REPEAT IT EXACTLY AS I SAID IT. OK? FOR EXAMPLE IF I SAY *THE LITTLE GIRL RAN AWAY* WHAT WOULD YOU SAY? If the child responds correctly say THAT'S RIGHT. NOW LISTEN CAREFULLY BECAUSE I'M GOING TO SAY OTHER SENTENCES. READY? At this point procede with the test items.

However, if the child fails the example say: LISTEN CAREFULLY st WHAT DID I SAY?

Whether the child suceeds or fails the second example procede to ITEM 1 of the test. Give no help on the second example or any of the test items.

SHORT TERM MEMORY TASK

7. Pretty shining raincoats attract children.(**MS**)

8. Cats closed stop doors some.(**RW**)

9. Pastry foxes many open worry. (**UW**)

10. Serious public raindrops debate houses. (**SA**)

11. Empty bottles litter public highways. (**MS**)

12. Nervous apples watch greasy kites. (**AS**)

13. Progress fathers hamper many backwards. (**RW**)

14. College outside happy supply easy. (**UW**)

15. Carry helpful many empty rabbits. (**UW**)

16. Pupils teachers disturb noisy sincere. (**RW**)

17. Many college students study language. (**MS**)

18. Worried sunny pastry supplies children. (**AS**)

19. Relax mornings workers pleasant Sunday. (**RW**)

20. Parties rivers litter feeling houses. (**UW**)

21. Empty smokers consult foolish gardens. (**AS**)

22. Open markets attract many flies. (**MS**)

INSTRUCTION FOR THE MORPHOPHONOLOGICAL TEST

I'M GOING TO SHOW YOU SOME PICTURES. The experimenter will show the appropriate picture(s) and read the appropriate text. the child should be encouraged to provide thr necessary responses and *the responses will be recorded phonetically* EXAMPLE # 1.

THIS IS A WUG. NOW THERE IS ANOTHER ONE. THERE ARE TWO OF THEM. THERE ARE TWO........... If the child does not respond corectly say LETS US SEE. ONE OF THESE (pointing at the bird like picture) IS CALLED A WUG. WHAT DO YOU SUPPOSE WE CAN CALL TWO OF THEM. If the child still does not understand after some help procede to item # 2. If again he fails the item go to item # 3. If this item is also failed stop testing and note the reason(s). If the child passes this otem continue testing.

MORPHOPHONOLOGICAL KNOWLEDGE TASK

1)*Plural. One bird like animal, then two.* THIS IS A WUG /Wag/. NOW THERE IS ANOTHER ONE. THERE ARE TWO OF THEM. THERE ARE TWO

2)*Plural.One bird then two. THIS IS A GUTCH /GAC/. NOW THERE IS ANOTHER ONE. THERE ARE TWO OF THEM. THERE ARE TWO*

3)*Past Tense. Man with a steaming pitcher on his head.* THIS IS A MAN THAT KNOWS HOW TO SPOW /SPOW/. HE IS SPOWING. HE DID THE SAME THING YESTERDAY. WHAT DID HE DO YESTERDAY. YESTERDAY HE

4)*Plural. One animal then two.* THIS IS A KAZH /KAEZ/. NOW THERE IS ANOTHER ONE. THERE ARE TWO OF THEM. THERE ARE TWO

5) *Past Tense. Man swinging an object.* THIS IS A MAN THAT KNOWS HOW TO RICK /RIK/. HE IS RICKING. HE DID THE SAME THING YESTERDAY. WHAT DID HE DO YESTERDAY. YESTERDAY HE

6) *Diminutive & compound or derived word. One animal, then a miniscule animal.* THIS IS A WUG. THIS IS A VERY TINY WUG. WHAT WOULD YOU CALL A VERY TINY WUG? THIS WUG LIVES IN A HOUSE (pointing at the large wug). WHAT WOULD YOU CALL A HOUSE THAT A WUG LIVES IN?

7) *Plural. One animal then two.* THIS IS A TOR /TOR/. NOW THERE IS ANOTHER ONE. THERE ARE TWO OF THEM. THERE ARE TWO

8) *Derived adjective. Dog covered with irregular green spots. THIS IS A DOG WITH QUIRKS ON HIM. HE IS ALL COVERED WITH QUIRKS. WHAT KIND OF DOG IS HE? HE IS A*

Plural. One flower then two. THIS IS A LUN /LAN/. NOW THERE IS ANOTHER ONE. THERE ARE TWO OF THEM. THERE ARE TWO

10) *Plural. One animal then two.* THIS IS A NIZ. NOW THERE IS ANOTHER ONE. THERE ARE TWO OF THEM. THERE ARE TWO

11) *Past Tense. Man doing calisthenics.* THIS IS A MAN THAT KNOWS HOW TO MOT /MAT/. HE IS MOTTING. HE DID THE SAME THING YESTERDAY. WHAT DID HE DO YESTERDAY. YESTERDAY HE

12) *Plural. One bird then two.* THIS IS A CRA /KRA/. NOW THERE IS ANOTHER ONE. THERE ARE TWO OF THEM. THERE ARE TWO

13) *Plural. One animal, then two. THIS IS A TASS. NOW THERE IS ANOTHER ONE. THERE ARE TWO OF THEM. THERE ARE TWO*

14) *Past Tense. Man dangling an object on a string. THIS IS A MAN WHO KNOWS HOW TO BOD. HE IS BODDING. HE DID THE SAME THING YESTERDAY. YESTERDAY HE*

15) *Third person singular. Man shaking an object.* THIS IS A MAN THAT KNOWS HOW TO NAZ. HE IS NAZZING. HE DOES IT EVERY DAY. EVERY DAY HE

16) *Plural. One insect, then two.* THIS IS A HEAF /HIYF/. NOW THERE IS ANOTHER ONE. THERE ARE TWO OF THEM. THERE ARE TWO

17) *Plural. One glass, then two.* THIS IS A GLASS. NOW THERE IS ANOTHER ONE. THERE ARE TWO OF THEM. THERE ARE TWO

18) *Past Tense. Man exercizing. THIS IS A MAN WHO KNOWS HOW TO GLING. HE IS GLINGING. HE DID THE SAME THING YESTERDAY. WHAT DID HE DO YESTERDAY? YESTERDAY HE*

19) *Third Person Singular. Man holding an object.* THIS IS A MAN WHO KNOWS HOW TO LOODGE /LUWDZ/. HE IS LOODGING. HE DOES IT EVERY DAY. EVERY DAY HE

20) *Past Tense. Man standing on the ceiling..* THIS IS A MANW WHO KNOWS HOW TO BING. HE IS BINGING. HE DID THE SAME THING YESTERDAY. WHAT DID HE DO YESTERDAY? YESTERDAY HE

21) *Singular and Plural Possessive. One animal wearing a hat, then two wearing hats. THIS IS A NIZ WHO OWNS A HAT. WHOSE HAT IS IT?.................... HAT. NOW THERE ARE TWO NIZZEZ. THEY BOTH OWN HATS. WHOSE HATS ARE THEY? THEY ARE THE ....HATS.*

22) *Past Tense. A bell. THIS IS A BELL THAT CAN RING. IT IS RINGING. IT DID THE SAME THING YESTERDAY. WHAT DID IT DO YESTERDAY? YESTERDAY IT*

23) *Singular and Plural Possessive. One animal wearing a hat then two.* THIS IS A WUG WHO OWNS A HAT. WHOSE HAT IS IT? IT IS THE.....................HAT. NOW THERE ARE TWO WUGS. THEY BOTH OWN HATS. WHOSE HATS ARE THEY? THEY ARE THE ....HATS.

24) *Comparative and Superlative of the adjective. A dog with a few spots, one with several, and one with a great number.* THIS DOG HAS QUIRKS ON HIM. THIS DOG HAS MORE QUIRKS ON HIM. AND THIS DOG HAS EVEN MORE QUIRKS ON HIM. THIS DOG IS QUIRKY. THIS DOG IS..................... AND THIS DOG IS THE

25) *Progressive & Derived Agentive or Compound. Man balancing a ball on his nose.* THIS IS A MAN WHO KNOWS HOW TO ZIB. WHAT IS HE DOING? HE IS............... WHAT WOULD YOU CALL A MAN WHOSE JOB IS TO ZIB

26) *Past Tense. An ice cube then a puddle of water. THIS IS AN ICE CUBE. ICE MELTS. IT IS MELTING. NOW IT IS ALL GONE. WHAT HAPPENED TO IT? IT*

27) *Singular and Plurar Possessive. One animal wearing a hat then two.* THIS IS A BIK WHO OWNS A HAT. WHOSE HAT IS IT? IT IS THE .... HAT. NOW THERE ARE TWO BIKS. THEY BOTH OWN HATS. WHOSE HATS ARE THEY? THEY ARE THE..................... HATS.

INSTRUCTION FOR THE AUDITORY PHONOLOGICAL SEGMENTATION AND SYNTHESIS TASK

To explain this test the examiner will first show the child the top half of a sheet of 8.5 x 11 inch paper on which the picture of a COW and a BOY'S HEAD has been drawn side by side. The experimenter akes the child to say *COWBOY*. After the child responds, the examiner covers the picture of the picture of the boy's head and says NOW SAY IT AGAIN BUT WITHOUT THE BOY. If the response is correct *COW* the experimenter exposes the bottom half of the sheet, showing the drawings of a TOOTH and a BRUSH. The experimenter askes the child to say *TOOTHBRUSH* and after the child reponds he is asked to say it again but tooth and says NOW SAY IT AGAIN BUT WITHOUT THE TOOTH. If the child fails either demonstration item, an attempt is made to teach the child the correct response by repeating the demonstration procedure with the pictures. If the child fails again to make the correct response to both items testing is discontinued and a score of 0 is recorded. If both responses are correct, the examiner will withdraw the picture sheet and procede with the test.

AUDITORY PHONOLOGICAL SEGMENTATION & SYNTHESIS

NAME........................DATE..........................
SCHOOL......................GRADE.........................
BIRTHDATE...................SEX...........................
Year Month Day

A. COW(BOY)..................

B. (TOOTH)BRUSH..............

1. BIRTH(DAY)................
2. (CAR)PET..................
3. BEL(T)....................
4. (M)AN.....................
5. (B)LOCK...................
6. TO(NE)....................
7. (S)OUR....................
8. (P)RAY....................
9. STEA(K)...................
10. (L)END...................
11. (S)MILE..................
12. PLEA(SE).................
13. (G)ATE...................
14. (C)LIP...................
15. TI(ME)...................
16. (SC)OLD..................

21. (SH)RUG..................
22. G(L)OW...................
23. CR(E)ATE.................
24. (ST)RAIN.................
25. S(M)ELL..................
26. ES(KI)MO.................
27. DE(S)K...................
28. GER(MA)NY................
29. ST(R)EAM.................
30. AUTO(MO)BILE.............
31. RE(PRO)DUCE..............
32. S(M)ACK..................
33. PHI(LO)SOPHY.............
34. S(K)IN...................
35. LO(CA)TION...............
36. CONT(IN)ENT..............

17. (B)REAK....................
18. RO(DE).....................
19. (W)ILL.....................
20. (T)RAIL....................
37. S(W)ING..................
38. CAR(PEN)TER...............
39. C(L)UTTER.................
40. OFF(ER)ING................